

Presenting a Theoretical Framework for the Emergence of State Emotion:  
Ontology and Methodology from the Calculation of Integrated Information

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By  
Stevan Jechura

The Ohio State University  
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Project Advisor: Professor Alexander Wendt, Department of Political Science

## ABSTRACT

The purpose of this thesis is to address the central challenge in State Emotion discourse: to theorize the processes that turn individual emotions collective, social, public, and, thus, political. To do so, I will provide an ontological justification for collective emotion at the state level, explaining *how* these emotions can influence decisions and providing a model for IR scholars to determine the *extent* of State Emotion's influence under particular circumstances.

My hypothesis proposes that the existence and function of State Emotion is not from the aggregation of individuals; rather, it is a structural process. This is established through two premises; first, that accepting institutionalized states as distributed networks and emotion as a causally emergent characteristic of intrinsic experience are fundamental components to establishing the ontology of State Emotion, and second, that conjoining the processes of experience with feelings allows for a more explicit theoretical methodology regarding the political function of State Emotion. It is with this intent that I bring Tononi's Integrated Information Theory of consciousness into the discussion and formulate my own theory of State Feeling.

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## INTRODUCTION

Whether it's been Death, Justice, or Mother Nature, societies have been using personification to convey prominent concepts for thousands of years. Personification has proven to be a useful tool by presenting abstract concepts in a form that provides an ease of understanding and by creating metaphors that allow the logic behind particular interactions to become more apparent. This is no less true in international relations theory, where most fundamental state behaviors are explained by anthropomorphizing states; they can fear their neighbors, desire more resources, or befriend a former enemy. However, while personification may be an insightful literary tool, there is concern when the theories political scientists weave using these references become the primary attributes of states in serious analyses, especially when these references are not intended to convey the true nuances behind state behaviors.

Most international relations scholars use personification as a convenient theoretical method to illustrate their theories on state agency, yet simultaneously reject the idea that a state could possibly possess intentionality in reality.<sup>1</sup> Such theorists adhere to the mainstream physicalist and reductionist perspectives in IR; culminating into the common belief that, although a state can appear to exhibit certain behaviors, it is nothing more than a collection of individuals sharing the same emotions and intentions. Howbeit, few theorists reject the application of intentionality in descriptive IR literature, despite disagreeing with

<sup>1</sup> Barkin, J. Samuel. *Realist Constructivism*. Cambridge, UK: Cambridge University Press, 2010.

the ontological notion of the state as an agent itself. This is due to its effective explanatory capabilities in predicting state behavior.<sup>2</sup> If we are to accept these perspectives in IR, it ought to at least be possible, if not more effective, to analytically reduce states to the individual level where the actual emotions and intentions are contained within physical bodies and only accessible to the politicians running the state when expressed by the majority of the population.

Conversely, this is often not the case when examining state-level decision-making. IR theorists have struggled to universally predict intentions solely based on the individual components within a state, which is necessary to reduce the state from a whole entity in analysis.<sup>3</sup> Scholars of foreign policy recognize the need to identify nuances in state behavior through individuals, using the psycho-analysis of specific leaders and applying leader stereotypes to particular decisions. This has proven to be beneficial in determining many theories on why states deviate from rational actor paradigms, which have often stumped many IR theorists.<sup>4</sup> Nonetheless, these analyses do not directly reflect *state* behavior, but rather the *leader* behavior often provides the reason behind it; this assumption carries limitations when associating public opinion and social structures, particularly in times of upheaval, directly to the decisions of the state. For this reason, the personification of states is essential to the fundamentals of almost every camp in IR theory; and, as Alexander Wendt argues, the necessity of this practice suggests that it is more than a mere shorthand for actual processes.<sup>5</sup>

Recently there has been a turn of focus onto the collective *emotion* of the populace as an

<sup>2</sup> Wendt, Alexander. "The state as person in international theory." *Review of International Studies*, 30 (2004): 289-316.

<sup>3</sup> Barkin, J. Samuel. *Realist Constructivism*. Cambridge, UK: Cambridge University Press, 2010.

<sup>4</sup> Hill, Christopher. *The Changing Politics of Foreign Policy*. Houndmills: Palgrave, 2003.

<sup>5</sup> Wendt, Alexander. "The state as person in international theory." *Review of International Studies*, 30 (2004): 289-316.

explanation of why states make ‘irrational’ decisions, being influenced by what many IR scholars call “State Emotion.” This concept has been explored through the emerging discourse initiated by Jonathan Mercer (2006) and Neta Crawford (2000). The study of collective emotions is not unique to political science; fields such as psychology and philosophy have entertained the idea for quite some time. Scholars in these fields, in addition to some in political science, have observed that collective emotion often has irreducible properties, in that everyone within a group does not necessarily have to share the same exact emotion for the emotion to become collective,<sup>6</sup> and not necessarily all emotions, even those that are shared between every member of the group, become collectively accessible.<sup>7</sup> Conclusively, collective emotion is hardly quantifiable through the analysis of individual members. Thus the collective emotions that most IR theorists assert have significant influence over state-level decision-making do not follow the same reductionist framework that implicitly drives empirical political analysis. The implications behind observing this non-reductionist behavior in a supposedly reductionist world suggest that the entire notion needs to be challenged, and necessitates an alternative methodology for future empirical inquiries.

State Emotion research has the capacity to challenge this notion, offering the potential to resolve many disputes between IR theorists and explain elusive political phenomena. By suggesting that a state entity could possess emotion and intentions, the personification of states becomes a reasonable strategy to model state behavior. The implications of State Emotion would additionally contribute to the agent-structure debate by providing an ontological reason for why a structure could exhibit intention and agency, perhaps allowing

<sup>6</sup> List and Pettit. “Group Agency and Supervenience.” *Southern Journal of Philosophy*, XLIV (2006): 85-105.

<sup>7</sup> Echterhoff, Gerald, E. Tory Higgins, and John M. Levine. "Shared reality experiencing commonality with others' inner states about the world." *Perspectives on Psychological Science* 4, no. 5 (2009): 496-521



for some states to qualify as “psychological persons” under frameworks that require experience as a part of agency.<sup>8</sup>

Even within State Emotion discourse, though, there are central disagreements that serve as obstacles to using State Emotion for solvency. Many of the theorists who support the concept of State Emotion differ significantly in their explanations of how emotions can exist outside of an individual, the reducibility of a State Emotion, and how the necessity of interpretation affects the salience of individual emotions within the collective. Critics of State Emotion wield these fundamental disagreements as evidence of a physicalist reality, alternatively suggesting that political scientists are merely observing individuals empathizing with their group identities fully created within the confines of their own minds. This is why Bleiker and Hutchison have asserted that “the most important challenge in political research on emotions, or at least the one that precedes all others: to theorize the processes that turn individual emotions collective, social, public, and, thus, political.”<sup>9</sup>

This challenge captures the two central issues for implementing State Emotion into International Relations Theory: the lack of an ontological foundation for macro-level analyses and the lack of a consistent methodology in micro-level applications. In order to validate the influence of State Emotions, theorists must address the process of individual emotions becoming collective emotions. As Brent Sasley asserts, “more explicit propositions about individual-to-group emotions transference will help make theorizing about states’ (or other group actors’) emotions more rigorous.”<sup>10</sup> A number of factors go into these processes, such as the links between people that make emotions salient in one group rather than another

<sup>8</sup> Wendt, Alexander. “The state as person in international theory.” *Review of International Studies*, 30 (2004): 289-316.

<sup>9</sup> Hutchison, Emma, and Roland Bleiker. “Theorizing emotions in world politics.” *International Theory* 6, no. 03 (2014): 491-514.

<sup>10</sup> Sasley, Brent E. “Theorizing States’ Emotions.” *International Studies Review*. 13, no. 3 (2011): 452-476

and whether the group emotion itself is merely a reflection of individual emotions or aggregated superveniently. Once its existence has been validated, theorists must also establish a methodology for theorizing the extent to which State Emotion becomes a determinant of state behavior - namely, to posit the circumstances that collective emotions manifest themselves into state-level decision-making.

The purpose of this thesis is to address these central issues in an effort to answer Bleiker and Hutchison's challenge: to theorize the processes that turn individual emotions collective, social, public, and , thus, political. To do so, I will provide an ontological justification for collective emotion at the state level, explaining *how* these emotions are manifested in state-decisions and providing a model for IR scholars to determine the *extent* of State Emotion's influence under particular circumstances.

My hypothesis proposes that the existence and function of State Emotion is not from the aggregation of individuals; rather, it is a structural process. This is established through two premises; first, that accepting institutionalized states as distributed networks and emotion as a causally emergent characteristic of intrinsic experience are fundamental components to establishing the ontology of State Emotion, and second, that conjoining the processes of experience with feelings allows for more explicit theorizing regarding the political function of State Emotion. It is with this intent that I bring Giulio Tononi's Integrated Information Theory of consciousness (IIT) into the discussion and formulate my own theory of State Feeling. To test this hypothesis, I will look at the background of the pertinent theories at hand, reflect on the considerations for solvency, apply the Integrated Information Theory to institutionalized states, and reflect on the implications, concluding with an outlook for future research.

## **The Analytical Road Map**

First, after briefly discussing the present discourse in the relatively new field of State Emotion, my argument will reflect on the prominent disputes that are the current obstacles to establishing an ontology. Then I will introduce IIT as a framework, elaborating on the nature of this theory to frame my future arguments.

Several considerations regarding the application of IIT follow: first, I will introduce how neuroscience has been applied to international relations theory, providing a precedent to follow as well as insights on the potential overuse of such theories. Then I focus on the applicability of IIT specifically, demonstrating how IIT does not carry many of the same pitfalls as other neuroscientific theories in IR. Since IIT calculates grades of experience rather than emotion, I subsequently explain the relevancy of experience to the formation of State Emotion. I will introduce the concept of State Feeling to offer additional insight in regards to this formation and additional analytical contexts. The final consideration will reflect the ways that the nature of IIT offers unique solvency apart from other neuroscientific theories to the prominent disputes of State Emotion discourse. By overcoming the common obstacles to ontology, I can proceed with confidence in its application to State Emotion.

After describing my methodology for applying IIT, I will define the fundamental axioms that enable IIT to work on the neural level. I will then move to the postulates, which are the analytical basis for attributing experience to certain entities while denying it to others. During the process of applying the postulates, I will refer to analogies at the state-level as well as existing social theories for additional justification. I will begin with the two postulates that are non-specialized and equally relevant to both mechanisms and systems; then I will move on to the next three postulates separately as they uniquely apply to the

mechanisms and the system. The *Exclusion* postulate poses a unique challenge to applying the theory to collectives and states; I respond by explaining the faults of the postulate's assertions before presenting my case for why institutionalized states can meet a more flexible interpretation of this postulate.

After a full examination of the complexities behind IIT, I will reflect on the implications of its application to the ontology of State Emotion. Then I will explain how the implementation of IIT on the state level would influence future methodology, suggesting that Tononi's notions of integration and differentiation, resulting in a quantity of " $\Phi$ " that could be re-purposed to determine the grade of experience an actor may have. This mathematical approach offers potential solvency for quantifying factors of State Feeling transference to State Emotion in decision-making.

Finally, I will offer additional opportunities for future research, associating the ontology of State Emotion with other areas of IR that have been otherwise difficult to comprehensively theorize; concluding with an examination of challenges and limitations of implementing this approach in IR theory.

## BACKGROUND

The prevalent perception of emotions in the IR community is that they play an influential, yet merely tangential, role in politics. Many scholars believe that either policy makers are entirely in control of the public's emotional image, consciously deliberating on the role of emotions in their decisions, or that the elusive nature of emotions impedes any serious theoretical inquiries into their influence on state leaders. The rapidly growing field of State Emotion challenges this perception, asserting that emotion plays a direct role in decision-making, and further, that emotions can be theorized under the appropriate methodologies. However, in their meta-analysis of State Emotion research, Bleiker & Hutchison determined that there is one central challenge before State Emotions can be ontologically salient in mainstream IR theorizing: "to theorize the processes that render individual emotions collective and thus political."<sup>11</sup> There remains substantial debate over this challenge, and even State Emotion scholars argue among themselves on how exactly State Emotion can apply to International Relations theory (as would be expected of a field still in its infancy). Many State Emotion scholars have combined neuroscientific studies with IR theories as a way to add rigor to their investigations. To aide in these debates, I introduce a new neuroscientific theory, the Integrated Information Theory of consciousness, to State Emotion discourse.

<sup>11</sup> Hutchison, Emma, and Roland Bleiker. "Theorizing emotions in world politics." *International Theory* 6, no. 03 (2014): 491-514.

## Present State Emotion Discourse

To understand the current state of research, we must first look to the initial inquiries that developed into the origin of this young field of research. State Emotion research is an extension of an insight originally developed in political psychology and foreign policy: that state leaders sometimes involve “the emotional rather than the calculating part of the brain” in making decisions.<sup>12</sup> Per contra, these initial insights left intact the dichotomy between cognition and emotion, dismissing the implementation of emotions within rational actor paradigms. Most of these theories only allowed for emotion to have a supplementary role, subscribing to the belief that emotion played an unnecessary yet occasionally influential role in decision-making.

Jonathan Mercer and Neta Crawford, considered to be the original scholars of State Emotion, were the first to address this dichotomy by asserting that emotions are equally influential, if not more so, than cognition in state-level decision-making. This changed the landscape of emotional analysis in IR theory, as this new perspective suggested that rationality and emotion are not mutually exclusive processes, and that both processes are analytically necessary to understand fundamental state behaviors. As Mercer put it, “understanding how rational actors think requires turning to emotions.”<sup>13</sup> These two theorists were also among the first to challenge the strictly reductionist viewpoint that state-level emotion is entirely attributable to each of the individuals that contribute to it. The two assumptions that emotion is fundamental, yet indirectly associated with, the analysis of state behavior have provided the foundation for most of the existing literature on State Emotion.

<sup>12</sup> Hutchison, Emma, and Roland Bleiker. “Theorizing emotions in world politics.” *International Theory* 6, no. 03 (2014): 491-514.

<sup>13</sup> Mercer, Jonathan. “Emotion and Strategy in the Korean War.” *International Organization*. 67, no. 2 (2013): 221–252.

Bleiker and Hutchinson identified that State Emotion inquiries each fall under one of two different approaches, defined as the macro and micro distinction. The main distinction is that “macro approaches devise general theories of how emotions matter in world politics while micro studies focus on how specific emotions gain resonance in particular political circumstances.”<sup>14</sup> In other words, macro approaches attempt to explain the processes of how individual emotions become salient at the group level and analyze the fundamental nature of such emotions. This is where theorists argue the existence, reducibility, and constitutional bindings of State Emotion. Micro approaches focus on circumstantial analyses to gain perspectives on how emotions may have influenced past decisions to provide insight onto how they may influence future decisions. This is where theorists argue State Emotion’s manifestation, function, and variance in decision-making. Three areas of common disagreement within State Emotion research initially emerged from the nature of these classifications and remain as obstacles that prevent the ontology of State Emotion in IR: the primacy of the body, the reducibility to the individual level, and the role of interpretation in its manifestation.

### **Obstacles Preventing an Ontology**

The primacy of the body debate is centered around the physicalist notion that emotions are held to internal mechanisms within a body, and therefore cannot exist outside of a biological organism. This has led political scientists such as Janice Stein to critique the attribution of emotion to groups: “How emotions move from the individual to the collective is still inadequately articulated... Groups, after all, do not feel or think; individuals do.”<sup>15</sup>

<sup>14</sup> Hutchison, Emma, and Roland Bleiker. "Theorizing emotions in world politics." *International Theory* 6, no. 03 (2014): 491-514.

<sup>15</sup> Stein, Janice G. "Threat Perception in International Relations." *The Oxford Handbook of Political Psychology*, edited by

Rose McDermott, in accordance with the notion of physicalism, asserts that physicality is absolutely necessary in considering the existence of emotion in any form, and thus emotions have no place in collective entities.<sup>16</sup> This is where many scholars against the notion of State Emotion have concluded that states are “ontologically incapable of having feelings”<sup>17</sup> due to the observation that a state does not have a spatially contiguous body. This hotly disputed nexus is captured well within the ‘no body, no emotion’ problem, in that “Emotion happens in biological bodies, not in the space between them.”<sup>18</sup> On the other extreme of the debate, some theorists such as LHM Ling suggest that emotions exist at a level that is independent from embodiment, following a dualist perspective on emotions.<sup>19</sup> However, almost all proponents of State Emotion, such as Mercer and Crawford, place their analyses within the scope of component emergence, subscribing to the notion that emotions require a body and that emotion is capable of exerting influence beyond the individual; yet, each disagree over whether or not the same emotions can be isolated within an individual apart from the group.

The individual reducibility of emotion is adamantly contended from within this middle ground, especially among the strongest proponents of State Emotion. Most scholars are divided between two camps; on one end, that State Emotion averages from a collective of individual emotions, or alternatively, that State Emotion merely mimics the majority’s emotions. This contention has created a fundamental fissure in State Emotion analysis, despite the reasoning behind each of these perceptions being very similar and often linked

Leonie Huddy, David O. Sears, and Jack S. Levy, 364–94. Oxford: Oxford University Press, 2013.

<sup>16</sup> McDermott, Rose. “The Feeling of Rationality: The Meaning of Neuroscientific Advances for Political Science.” *Perspectives on Politics* 2, no. 104 (2004): 691–706.

<sup>17</sup> Digeser, Paul. “Friendship Between States.” *British Journal of Political Science* 39, no. 2 (2008): 323–44.

<sup>18</sup> Mercer, Jonathan. “Feeling like a state: social emotion and identity.” *International Theory*. 6, no. 03 (2014): 515–535.

<sup>19</sup> Ling, L.H.M. “Decolonizing the International: Towards Multiple Emotional Worlds.” *International Theory*. 6, no. 3 (2014): 579–83.



by similar approaches. Both perspectives rely on individuals to produce the emotion, proposing that State Emotion is based on component emergence with the aggregation of individual emotions; however, Mercer fundamentally argues that “group level emotion is powerful, pervasive and irreducible to individuals”<sup>20</sup> while Crawford emphasizes that categorizing groups as minimally-reducible entities for feelings “would be both imprecise and perhaps even dangerous.”<sup>21</sup> While Mercer’s compromise of extending physicalism with component emergence is perhaps the most popular conclusion for State Emotion, the results of many sociological experiments have made both perspectives inconclusive; consequently, many scholars question whether State Emotion can exist at all if it cannot be reduced to observable entities.

The role of interpretation has been used as a double-edged sword for both reductionist and non-reductionist perspectives. Both extremes commonly agree that there is at least some degree of representation and interpretation in communication; the conclusion of which asserts that no two humans can truly know the nuances of each other’s emotions.<sup>22</sup> Reductionists in IR argue that this is the reason why collective emotion appears to differ from the sum of its parts, as there is an inauthentic representational difference rather than an existential difference.<sup>23</sup> Non-reductionists argue that representation is the key link to the existence of State Emotion, as they assert State Emotion cannot exist without a culture or shared interpretations.<sup>24</sup> The nuances of this role are further debated between non-reductionists; while these scholars agree that there is always a level of interpretation in

<sup>20</sup> Mercer, Jonathan. "Feeling like a state: social emotion and identity." *International Theory*. 6, no. 03 (2014): 515-535.

<sup>21</sup> Crawford, Neta C. "The passion of world politics: Propositions on emotion and emotional relationships." *International Security* 24, no. 4 (2000): 116-156.

<sup>22</sup> Gallagher, Shaun, and Somogy Varga. "Social Constraints on the Direct Perception of Emotion and Intentions." *Topoi: An International Review of Philosophy* 33 (2014): 185-99.

<sup>23</sup> Bleiker, Roland. *Aesthetics and World Politics*. Basingstoke: Palgrave Macmillan, 2012.

<sup>24</sup> Parkinson, Brian, Agneta H. Fischer, and Antony SR "Manstead. Emotion in social relations: Cultural, group, and interpersonal processes." *Psychology Press*, 2005.

represented emotions, there is disagreement on the extent to which culture and intention affect what individuals convey to one another as well as the overall influence such interpretations play at the state level of decision-making.<sup>25</sup>

These disputes characterize the obstacles that challenge the solvency of State Emotion. To overcome these obstacles, Bleiker and Hutchison point out the necessity “to theorize the processes that turn individual emotions collective, social, public, and , thus, political.” I theorize that this can be done by implementing the Integrated Information Theory of consciousness to institutionalized states, if we define a state as a distributed network and emotion as a characteristic of intrinsic experience.

### **The Integrated Information Theory of Consciousness (IIT)**

Scholars of State Emotion have frequently turned to neuroscientific studies to provide a basis for their arguments. Many of these scholars heavily depend on neuroscience to make sense of their assertions, while others are wary of implementing these studies fully into the realm of political science. The Integrated Information Theory of consciousness is a neuroscience theory that, I argue, has direct relevancy to the study of International Relations theory, specifically to State Emotion, in a way that offers unique solvency from other neuroscientific inquiries. First, I will reflect on the development of IIT, examining the insights it has brought to the scientific understanding of consciousness. Then I will explain the advantages of using neuroscience in IR to explain the general direction of this particular analysis throughout the broader discourse. I will reflect on the common critiques and limitations of using neuroscience to frame the advantages of using IIT over other neuroscientific theories, looking at the adaptive nuances of this perspective. Finally, I’ll

<sup>25</sup> Ross, Andrew A.G. “Coming in from the Cold: Emotions and Constructivism.” *European Journal of International Relations*. 12, no. 2 (2006): 197–222.

demonstrate the relevancy of these insights directly to the nature of emotion and how they serve to overcome the obstacles to ontology in State Emotion research.

IIT was developed by Giulio Tononi in 2004 to provide a possible account for the mind-body problem which has plagued the field of philosophical phenomenology for centuries. Rather than theorizing the ethereal properties of consciousness, Tononi focuses on defining it in objective terms and determining how it can be generated. This is a much more scientific approach, as comparing the neural correlates behind consciousness against the predictions of his theory has been made increasingly apparent through advances in neuroscience, validating much of his work. He updated his theory and model in 2008, 2012, and 2014 to establish more explicit calculations of intrinsic experience as a contextually emergent property of sufficiently complex and distributed networks.

The core motivation of IIT is to provide the means to “analyze systems of mechanisms to determine if they are properly structured to give rise to consciousness, how much of it, and of which kind.”<sup>26</sup> There are many key understandings that are supported throughout the axioms and postulates of the theory and will be relied upon for the application of IIT to collectives. First, Tononi asserts that consciousness is synonymous with experience.<sup>27</sup> This is also in line with social theories on state personhood, which look at experience as a necessary prerequisite for consciousness.<sup>28</sup> Second, Tononi asserts that experience is “an intrinsic property of a complex of mechanisms” rather than solely dependent on a certain biological composition, subsequently removing the limitations for animals or “manufactured

<sup>26</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>27</sup> Tononi, Giulio. "Integrated information theory of consciousness: an updated account." *Archives italiennes de biologie*, 150, no. 4 (2012): 56-90.

<sup>28</sup> Wendt, Alexander. "The state as person in international theory." *Review of International Studies*, 30 (2004): 289-316.

entities” to possess some level or form of intrinsic experience.<sup>29</sup> Third, he suggests that the causal emergence of experience originates from the manifestation of a non-zero quantity of integrated information within a network.<sup>30</sup> Namely, he implies that the fundamental substrate of experience is the integrated information that is sufficiently organized in certain systems; one cannot exist without anticipating a minimal presence of the other. Fourth, he asserts that experience can be mathematically calculated on a spectrum, proposing that there are different grades of consciousness that vary between systems rather than regarding the possession of experience as an absolute trait.<sup>31</sup>

By analyzing consciousness through these understandings, IIT has offered ontological support for many of the observations in neuroscientific inquiries, particularly the loss and recovery of consciousness associated with experimental manipulation of information integration within the human brain.<sup>32</sup> This approach has garnered major support among scientists, inspiring the application of the IIT tenets to data on neural and computational networks, creating new traditions of theoretical neuroscience. Tononi has developed a mathematical framework for neuroscientists to infer which causal structures could feasibly possess consciousness, based both on principle and to guide research, which will hopefully allow for comparative calculations of consciousness between different biological organisms once future advances in neuroscience provide clearer maps of more complex neural structures.

<sup>29</sup> Tononi, Giulio. “Consciousness as integrated information: a provisional manifesto.” *The Biological Bulletin*, 215, no. 3 (2008): 216-242.

<sup>30</sup> Tononi, Giulio. “An information integration theory of consciousness.” *BMC Neuroscience* 5, no. 1 (2004): 1-22.

<sup>31</sup> Tononi, Giulio. “Consciousness as integrated information: a provisional manifesto.” *The Biological Bulletin*, 215, no. 3 (2008): 216-242.

<sup>32</sup> Ibid.

## **CONSIDERATIONS**

To frame the role of my hypothesis in the context of State Emotion research and to demonstrate the unique solvency of the Integrated Information Theory, several logical considerations of its merit must be explored. First, I will look at the strengths of using a neuroscientific approach for State Emotion by examining its current prevalence in international relations theorizing, reflecting on both the positive and negative attributes of utilizing neuroscientific insights within the discipline. Then I will focus on the applicability of IIT specifically, pointing to the ways that it overcomes the common disadvantages of mainstream neuroscience. Determining the relevance of experience, and therefore IIT, in the formation of emotions will lead to a few observations that justify a theory of State Feeling. Finally, I will reflect on IIT's ability to overcome the previously examined obstacles to developing an ontology of State Emotion, solidifying the reasoning for why the logic of IIT should take precedence over other theories to support the formation of State Emotion.

### **Insights of Neuroscience in IR**

There are many advantages to applying neuroscience, particularly IIT, to International Relations theory, as evidenced by the prominent use of neuroscience in previous publications on State Emotion. In her own observations on this trend, Rose McDermott pointed to the most attractive reason as to why neuroscience has been used time and time again in this new field: the ability to provide quantifiable, "hard scientific" answers to the

most elusive questions.<sup>33</sup> While it is not necessary for theorists to be empirically-minded, offering empirical support for new theories, especially those that are not widely accepted as fundamental truths in international relations, offer credibility in a way that case studies and historical examples simply cannot rival.

The empirically-focused field of neuroscience fits within State Emotion research in a way that is not often found in other areas of IR, and scholars have been quick to take advantage of this link to develop more sound theories. As McDermott puts it, “The inherently physical system on which emotion appears to rely, at least in part, provides a window into an interesting and more empirically supported theoretical structure for developing models that inform our understanding of the role of emotion in the political world.”<sup>34</sup> Even Renée Jefferey, a strong critic of using neuroscience in IR theory, has admitted that these studies have “revealed key facts about how the emotions function within the human brain that are of direct relevance to the study of international politics.”<sup>35</sup> In addition, the influx of new discoveries in neuroscience offer direction for IR theorists. The results of experiments and studies make causal inferences that aren’t always intuitive, connecting factors that would otherwise be elusive. Thus, neuroscience provides the IR community with “stubborn facts... reliable information about cause and effect that inspires and constrains theory.”<sup>36</sup>

In fact, the field of State Emotion owes its most fundamental idea to neuroscience - that emotion is a part of rational decision-making. Damasio’s assertion that emotions “assist the

<sup>33</sup> McDermott, Rose. “The Body Doesn’t Lie: A Somatic Approach to the Study of Emotions in World Politics.” *International Theory* 6, no. 3 (2014): 557–62.

<sup>34</sup> Ibid.

<sup>35</sup> Jeffery, Renee. “The promise and problems of the neuroscientific approach to emotions.” *International Theory* 6, no. 03 (2014): 584-589

<sup>36</sup> Druckman, James N., Donald P. Green, James H. Kuklinski, and Arthur Lupia. “Experiments: An Introduction to Core Concepts.” *Cambridge Handbook of Experimental Political Science*, 2011.

reasoning process,”<sup>37</sup> as well as his 1994 Somatic Marker Hypothesis, offer a foundation for the importance of State Emotion in decision-making, which has encouraged further research in this field. The discovery that reasoning and emotion are identical at a neurological level<sup>38</sup> has further solidified State Emotion as a considerable influence in state-level decision-making, irrefutably stirring the ‘emotional turn’ in IR theory.

Howbeit, while neuroscience is in many ways fundamental to State Emotion, critics have warned about the overuse of such studies in international relations, often citing the conceptual differences in mindset and methodology that each field embraces. The two most divergent areas of perspective lie within materialism and emergence. As Neta Crawford points out, the antimaterialist mindset of the humanities conflicts with essence materials in neuroscience. Fields of social science have often relied on antimaterial theories, hence the alternative rankings between the ‘soft’ and ‘hard’ sciences.<sup>39</sup> Individual and social human behavior is often theorized through case studies and observational surveys, as the inconsistency in its nature and ethical implications limit the methodology of social experimentation. Neuroscience, on the other hand, is almost entirely a hard science; experiments often yield nearly identical, repeatable results with low margins of error. Indeed, it would appear that this dichotomy between the soft and hard science has already predictably created barriers in State Emotion inquiries that rely on neuroscience, as Jefferey explains; “a straightforwardly materialist understanding of the emotions, with its emphasis on the neural processes of the individual brain, appears unable to account for collective emotions insofar as they are more than the sum of individual members’ experiences” and

<sup>37</sup> Damasio, Antonio R. *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*. San Diego: Harvest, 2000.

<sup>38</sup> Phelps, Elizabeth A. "Emotion and cognition: insights from studies of the human amygdala." *Annual Review of Psychology*. 57 (2006): 27-53.

<sup>39</sup> Crawford, Neta C. "Institutionalizing Passion in World Politics: Fear and Empathy." *International Theory* 6, no. 3 (2014): 535–57.

that “within an anti-materialist, social account of the emotions in international relations, the contribution of neuroscientific methods will always be limited.”<sup>40</sup>

McDermott adds to these critiques by pointing out how the somatic nature of neuroscience fundamentally contrasts to the seemingly emergent nature of State Emotion, and consequently suggests that State Emotion must be conceptually reevaluated as a result. She argues that, within a neuroscientific frame of thought, emotion is typically regarded to be, in some way, reducible to neurological inputs and outputs that can be physically observed.<sup>41</sup> However, scholars who agree with Mercer that State Emotion is irreducible to the individual level must subscribe to a perspective that emotion has components that are more than the simplicity of individual neurons. This poses a conceptual problem: “If we take the neuroscience arguments seriously, emotion must necessarily be grounded in somatic experience in the physical body or it would not exist at all, therefore making subsequent social experience and transformation of such emotional experience impossible.”<sup>42</sup>

While these differences have provided legitimate limitations on the field of State Emotion, there are a few considerations that theoretically allow for a stronger connection between neuroscience and international relations. McDermott has provided an ultimatum of necessity for future State Emotion researchers to retain a notion of irreducible aspects in their theories: “Any alternative model must either present support for the foundation of emotional experience in another material form, which would be hard to imagine, or posit an ethereal existence, which enters the realm of the spiritual.”<sup>43</sup> Although this was originally part of her argument for why State Emotion must be redefined as reducible to the individual

<sup>40</sup> Jeffery, Renee. “The promise and problems of the neuroscientific approach to emotions.” *International Theory* 6, no. 03 (2014): 584-589

<sup>41</sup> McDermott, Rose. “The Body Doesn’t Lie: A Somatic Approach to the Study of Emotions in World Politics.” *International Theory*. 6, no. 3 (2014): 557–62.

<sup>42</sup> Ibid.

<sup>43</sup> Ibid.



level, the possibility of finding another material form is not as unlikely as McDermott believes. The IIT model rests on providing another material form for emotional experience, thus making it a likely candidate to overcome these limitations and maintain that State Emotion is irreducible.

### **The Applicability of IIT**

IIT is strongly applicable to State Emotion theorizing while still retaining the strengths inherent to the empirical nature of mainstream neuroscientific studies. To best understand the advantages of IIT over more mainstream neuroscience, we can reevaluate the two prominent dichotomies between the soft and hard sciences, this time looking at the unique nature of the conclusions derived from IIT.

The underlying logic used in the understandings of IIT focuses on the structural similarities between brain networks that enable discussions on the implications of those similarities. In other words, if two neural networks respond to inputs in similar ways and share a functionally similar structure, then their byproducts, and perhaps even the intended outputs themselves, will also be similar. This is known as causal emergence<sup>44</sup>, and allows Tononi to assert that any causal distributed network that generates integrated information can fall under the scope of IIT. For example, the common application of the IIT model between organisms ignores the differences in genetic components and focuses entirely on the structure of the brain. Although the genetic makeup of neurons, and sometimes even the physical properties of neurons, differ from one organism to the next, IIT still applies so long as the structure between the neurons is functionally similar.<sup>45</sup> Thus, the mechanisms only

<sup>44</sup> Beekermann, Ansgar. "Supervenience, Emergence, and Reduction." *Emergence or Reduction? Essays on the Prospects of Nonreductive Physicalism*, 1992.

<sup>45</sup> Tononi, Giulio. "Consciousness as integrated information: a provisional manifesto." *The Biological Bulletin*, 215, no. 3

need to be functionally similar, not physically identical, when it comes to the traits of a network giving rise to similar byproducts, such as consciousness.

IIT provides another material form for the analysis of State Emotion by asserting that experience - including the emotional - is a causally emergent property of a network rather than based in biological composition.<sup>46</sup> Conveniently, this requires that a physical substrate in the body is still a necessary component, remaining in compliance with the implications of materialism in both neuroscience and State Emotion; McDermott acknowledged that the ‘body’ could be defined “at least within the architecture of the human brain,”<sup>47</sup> which is precisely the material form that IIT uses. Therefore, IIT still abides by the common mindset in neuroscience while simultaneously serving to explain emergent processes in State Emotion. By implementing this ‘architecture’ on a larger scale, IR theories stand to gain insight rather than becoming limited.

As an inherently causal emergence theory, unique from the mechanical emergence (tied purely to Newtonian physics) and component emergence (tied to the properties of the substrate for its collective properties) that are fundamental to most neuroscientific studies used in State Emotion research, IIT relies on somatic reasoning in a way that enables a scientific discussion between the functions of neurons and humans. While physiologically each neuron is much simpler than an entire human, their functional expressions in networks are very similar to our own at the collective level, especially as it pertains to the integration of information. It is often a prominent misconception that neurons are simple biological feed-forward systems; namely, that they are binary systems with only “on” and “off”. In fact,

(2008): 216-242.

<sup>46</sup> Tononi, Giulio. "An information integration theory of consciousness." *BMC Neuroscience* 5, no. 1 (2004): 1-22.

<sup>47</sup> McDermott, Rose. "The Body Doesn't Lie: A Somatic Approach to the Study of Emotions in World Politics." *International Theory*. 6, no. 3 (2014): 557-62.

they are incredibly complex biological organisms, working interdependently to construct what we define as the brain.<sup>48</sup> Thus, component emergent theories that restrict neuroscientific applications due to our own individual complexity become irrelevant in this context.

Therefore, the limitations of somatic perspectives in neuroscience are not as prohibitive as McDermott and other IR theorists have asserted. IIT argues for a form of emergence that relates directly to the nature of State Emotion, as the existence of a state relies on the external functions of individuals just as our own consciousness relies on the functional expressions between neurons. Without the ability for humans to communicate, a state cannot exist, just as a clump of unconnected neurons does not consist of a mind. This gives IIT a unique level of solvency that other neuroscientific theories have failed to account for.

### **The Relevance of Experience in Theorizing State Emotion**

It is not simply enough to explain how IIT is applicable in IR, as there can be logically applicable theories that are ultimately unfruitful in analysis. The utility of the IIT model lies in the necessity of some level of experience, defined within IIT as consciousness, for feelings to become emotions. Crawford asserted that “emotions can become part of a feedback loop of behavior and feelings.”<sup>49</sup> Additionally models of emotion formation are necessarily predicated on intrinsic experience and somatic feelings, as emotions are the contextualization of experiencing those feelings under specific circumstances.<sup>50</sup> Yet, there is currently no notion of “State Feeling” recognized in State Emotion discourse. The

<sup>48</sup> Bullock, Theodore Holmes. "Signals and signs in the nervous system: the dynamic anatomy of electrical activity is probably information-rich." *Proceedings of the National Academy of Sciences* 94, no. 1 (1997): 1-6.

<sup>49</sup> Crawford, Neta C. "Institutionalizing Passion in World Politics: Fear and Empathy." *International Theory* 6, no. 3 (2014): 535–57.

<sup>50</sup> Barlassina, Luca, and Albert Newen. "The Role of Bodily Perception in Emotion: In Defense of an Impure Somatic Theory." *Philosophy and Phenomenological Research*, 2013, 637-78.

recognition of State Feeling's importance is essential for emotional experience to play a key role in future IR research.

State Emotion scholars often conflate emotion and feeling together, sometimes acknowledging doing so and dismissing the association as inconsequential to their analyses.<sup>51</sup> This is often because of the psychological dichotomies that could potentially complicate the analogies that they use in analyzing the effects of collective emotions. I argue that this is a mistake that has clouded rather than simplified the arguments behind State Emotion; the conflation of these definitions has often necessitated additional reasoning to cover analogous gaps between collective emotion to individual emotion, which has drawn skepticism to the entire notion itself. Without a theoretical avenue for feelings to become emotions, the implications of State Emotion cannot be conceptually analogous to the similar psychological processes that rely heavily upon that avenue. By examining the necessity of this defined difference in psychology, it will become apparent that a theory of State Feeling and the experience of those feelings are necessary components for current theories of State Emotion.

Until recently, there has been a prominent dichotomy in emotion theorizing between affect oriented theories and cognitive oriented theories. These two classifications have argued over the phenomenological existence of emotion as well as the process of emotion formation. The defined separation of feeling from emotion has been critical in the consolidation and resolution of this dichotomy in many psychological theories, which is why it should serve as an insightful practice in State Emotion theorizing.

The first advancement in emotion theorizing was led by psychologists William James

<sup>51</sup> Mercer, Jonathan. "Feeling like a state: social emotion and identity." *International Theory*. 6, no. 03 (2014): 515-535.

and Karl Lange, who proposed that emotions are entirely perceptions of bodily states, thus characterizing the affect oriented approach.<sup>52</sup> The implications of this theory changed the prominent perspectives at the time; rather than a physical response being a result of an emotion, James and Karl were suggesting that the emotions were the result of acknowledging our physical response. For example, an upset stomach would give way to the understanding that one is experiencing fear.<sup>53</sup> However, the James-Lange theory fails to account for the ability to overcome feelings, conflicts between feelings and emotions, and the existence of emotions in anticipation of something that is not present or does not physically exist.

Keith Oatley developed the cognitive theory of emotions to resolve these discrepancies; he asserted that emotions were the result of an assessment of a particular situation based on reason. Namely, if it is logical to anticipate being unprepared for a pop quiz, then one will feel fear even before it is present.<sup>54</sup> Under this assertion, happiness is a way of telling the mind that the environment is safe and fear is a way of telling the mind that there is a threat in the environment. Despite the lasting popularity of this theory, psychologist Albert Newen has recently pointed out that this theory falls short as it avoids an explanation for the role of somatic feelings, under the context of an evolutionary advantage or otherwise.<sup>55</sup>

In response to this dichotomy, Luca Barlassina and Albert Newen developed the “integrative embodiment theory of emotions” that combines these two camps. This theory asserts that an emotion only exists when the experience of a somatic feeling is integrated

<sup>52</sup> James, William. “What is an emotion?” *Mind*, 9 (1884): 188-205.

<sup>53</sup> Ibid.

<sup>54</sup> Oatley, Keith, and Philip N. Johnson-Laird. "Towards a cognitive theory of emotions." *Cognition and emotion* 1, no. 1 (1987): 29-50.

<sup>55</sup> Barlassina, Luca, and Albert Newen. "The Role of Bodily Perception in Emotion: In Defense of an Impure Somatic Theory." *Philosophy and Phenomenological Research*, 2013, 637-78.

with a cognitive assessment of an intentional object.<sup>56</sup> For example, encountering a snake could initially invoke a fearful feeling; however, if the individual believes they are safe from the snake, the individual would not have the emotion of fear despite the continued presence of the somatic reaction. Due to the feedback provided by integrating the information, cognitive assessments could then change the feeling or increasing the strength of the feeling could encourage a cognitive re-evaluation of the situation. This circular nature allows for feelings to result from a cognitive assessment as well, allowing somatic responses to imagined scenarios. Additionally, the model provided by this theory is not only congruent with IIT; it complements IIT since both rely on information integration to satisfy their conclusions. Therefore, I will use Barlassina and Newen's integrative embodiment theory of emotions as the central logic to provide examples of the manifestation of State Feeling in institutionalized states, further demonstrating why the separation of feeling from emotion should be a common practice for State Emotion theorizing.

### **Contexts of State Feeling**

Since many State Emotion theorists have operated on a conflated definition of feelings and emotions, there are many previously established examples of collective emotion that, by creating a defined separation of these processes, would actually fall under the scope of State Feeling. For the purposes of this analysis, State Feeling will be defined as a collective domestic reaction to an international situation, just as a somatic feeling is an internal reaction to an environmental situation. My definition of State Emotion will extend Barlassina and Newen's integrative embodiment theory of emotions to the state level: the combination of the state's experience of State Feeling with the cognitive assessment of an

<sup>56</sup> Ibid.

international context. To provide clarity to this distinction, I will implement analogies between humans and states as well as components of existing social theories relating to collective intentions.

The contextualization of a somatic feeling to create an emotion is a similar process in both humans and states. If an individual has a stomach ache, then that is a somatic feeling in response to a situation (the situation could either be present or imagined, but it has provoked a physical response nonetheless). A stomach ache out of context does not provide an understanding of the individual's emotion; the individual may be nervous, but they are equally likely to simply be hungry. By cognitively assessing the situation, which can be done unconsciously in response to a familiar environment or context, the emotion becomes apparent. Knowing that one will be taking a test in the near future forms the emotion of anxiety, thus motivating the individual to study rather than eat. Integrating the information of a somatic feeling with contextual information gives the individual an emotional experience that can be used to act towards an intentional object.<sup>57</sup>

In the case of a state, a riot affecting the federal government would qualify as a State Feeling; riots, panics, and similar collective reactions often represent a feed-forward aggregation of the fight-or-flight response rather than an organized decision-making entity. Instead, the governing leaders that are embedded in the institution serve as the mechanisms of the state that turn State Feelings into State Emotions; they can establish a cognitive assessment of the situation by having the contextual knowledge that the riots must be a negative reaction to recent sanctions enacted against the state, and proceed to stir the State Emotion of anger or resentment toward the states that enacted the sanctions. This process is

<sup>57</sup> Barlassina, Luca, and Albert Newen. "The Role of Bodily Perception in Emotion: In Defense of an Impure Somatic Theory." *Philosophy and Phenomenological Research*, 2013, 637-78.

embodied by Crawford’s interpretation of how State Emotion becomes “institutionalized.” She provides a convenient model that portrays the interactions of these elements at the individual level, although feelings and emotions are used interchangeability, shown in Figure 1 (from Crawford 2014).

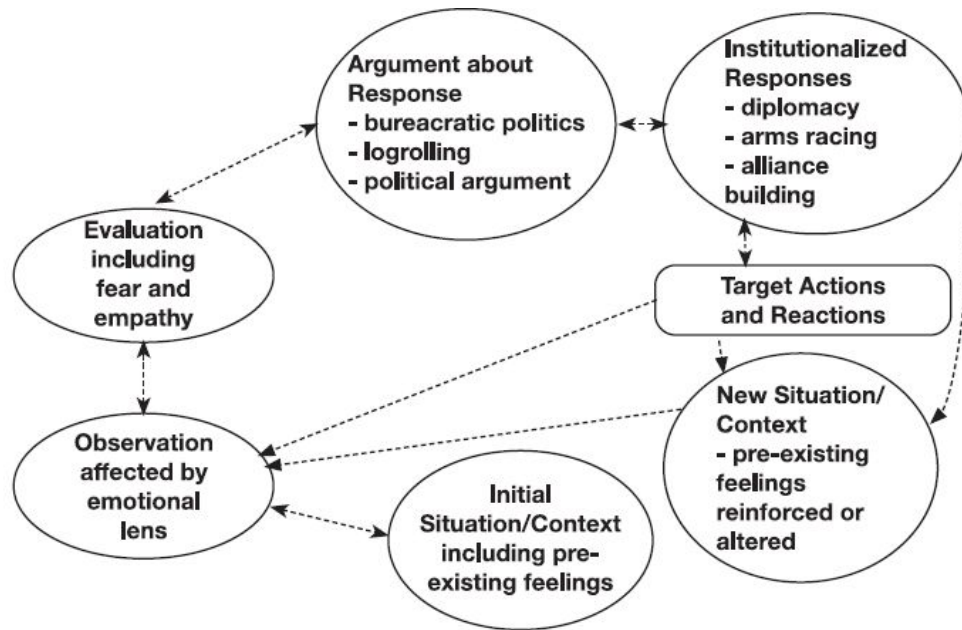


Figure 1. Crawford’s “Institutionalization” of Emotion

To support the qualification of a riot as a State Feeling rather than a State Emotion, List and Pettit’s Group Agency theory is particularly useful. The dichotomy of “proposition-wise supervenience” versus “set-wise supervenience” can explain why such *collective* emotions cannot be defined as a *State* Emotion; although the riot was formed from the aggregation of individual emotions, the riot as a group does not have a “Constitution,” that is, there lacks an organizational structure within the group that allows



for the processing of individual emotions into a collective output.<sup>58</sup> Subsequently, a riot would be an example of proposition-wise supervenience, the existence of which requires that the set of individuals must all share the same intention in order for that intention to be translated to the group level.<sup>59</sup> List and Pettit argue that, due to the lack of constitution, such entities cannot possess intention or decision-making capabilities.<sup>60</sup> Without any form of intention, particularly at the level of international decision-making, a collective can only serve as a sub-mechanism of the state, not as a direct representative for State Emotion.

On the other hand, the institutionalized state as a whole would have set-wise supervenience, which indicates that a group intention is formed from a range of intentions over a range of issues that particular individuals do not need to precisely share; subsequently, group intentions could differ significantly from what any one individual had in mind.<sup>61</sup> In this case, the leaders would not necessarily experience anger as individuals, nor as members of the state; for this to be true, the leaders must experience the same emotion first-hand, which is not a reliably consistent measure outside of authoritarian regimes.<sup>62</sup> Instead, they would be experiencing anger *as* the state, politically motivated by it but not necessarily personally-motivated, which plays an important part in theorizing state behavior.

Additionally, the associated survival purposes of the feeling-emotion balance for individuals can apply equally to states, encouraging its development in both entities. To stop a feeling requires resolving the stimulating issue, and as such, uncomfortable or negative feelings serve as a strong motivational force. Each actor will continue to make

<sup>58</sup> List and Pettit. "Group Agency and Supervenience." *Southern Journal of Philosophy*, XLIV (2006): 85-105.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid.

<sup>61</sup> Ibid.

<sup>62</sup> Ibid.

emotionally-motivated decisions until the feeling and subsequent emotion has dissipated.<sup>63</sup> This psychological argument for individuals is consistent with Smith and Mackie's Intergroup Emotions Theory that analyzes collective emotions. They argue that group behaviors are emotionally motivated; after generating a behavior, the behavior can, in turn, change the circumstances that stimulated the collective emotion. Since the collective emotion dissipates in those scenarios, it can be deduced that the behavior was emotionally-motivated and that the collective emotion only exists when necessary to drive the behavior.<sup>64</sup>

Such motivations are essential for survival; for example, experiencing fear can lead to behaviors that reduce that fear, such as avoiding a predator (or a war); this in turn makes the individual - or the state - more likely to live longer.<sup>65</sup> Furthermore, knowing that one is safe from the threat, despite the presence of fearful somatic feelings, would not instill fear, which is advantageous as it avoids unnecessary behavior that may otherwise bring attention from a real threat. Referring back to List and Pettit's Group Agency theory, the association of intention with set-wise supervenience over proposition-wise supervenience could be sufficiently explained through the attribution of State Emotion and State Feeling to each type of group under a survival context; states are capable of intention and behavior<sup>66</sup> because they have access to emotions, which are key to regulating survival responses, whereas collectives such as riots cannot have agency predicated solely on feelings<sup>67</sup> due to the potential dangers that reacting solely on feelings would entail.

<sup>63</sup> Darwin, Charles. *The Expression of the Emotions in Man and Animals*. Chicago: University of Chicago Press, 1965.

<sup>64</sup> Smith, Eliot R., and Diane M. Mackie. "Intergroup Emotions." *Handbook of Emotions*, 3rd edition, edited by Michael Lewis, Jeannette M. Haviland-Jones, and Lisa Feldman Barrett. New York: The Guilford Press, 2008.

<sup>65</sup> Izard, Carroll E. "Emotion theory and research: Highlights, unanswered questions, and emerging issues." *Annual Review of Psychology* 60 (2009): 1.

<sup>66</sup> List and Pettit. "Group Agency and Supervenience." *Southern Journal of Philosophy*, XLIV (2006): 85-105.

<sup>67</sup> Ibid.

These observations allow us to understand emotion as a culmination of feelings, experience, and cognition, the purpose of which is specifically to motivate behavior. Since this model provides a methodology for determining the influence of popular opinion over the opinion of a leader in determining state behavior, even in irrational circumstances, there is strong support for using a separate distinction of State Feeling in the future analysis of State Emotion. However, the transference of State Feeling to State Emotion still necessitates a theory of experience. IIT can establish this theoretical avenue for State Feelings to become State Emotions.

### **The Advantages of IIT to Address Obstacles to Ontology**

The obstacles to ontology that have yet to be matched by other neuroscientific theories should be addressed before we apply IIT; the primacy of the body, reducibility, and the role of interpretation. The logic of IIT allows for scientifically acceptable resolutions to the ambiguous nature of State Emotion, using emergence to explain much of the non-observable phenomena within a state. It is for this reason that the acceptance of IIT should take precedence over other neuroscientific theories if it suitably accounts for the obstacles to an ontology of State Emotion that cannot otherwise be determined through reason alone.

The ‘no body, no emotion’ problem is often framed in regards to spatial contiguity; a body (i.e. brain) often defined as an indivisible mass of smaller codependent organisms with close and consistent proximity.<sup>68</sup> However, this assumption is based on a correlation rather than causation; while spatial contiguity makes the interactions between neurons easier, it is not entirely necessary for the communication that gives rise to consciousness.

<sup>68</sup> Wendt, Alexander. “The state as person in international theory.” *Review of International Studies*, 30 (2004): 289-316.

Neurons do not rely solely on physical connections to communicate, as they can rely on the release of chemicals in addition to electrical signals, just as we can communicate through spoken word in addition to touch.<sup>69</sup> Instead, Fred Dretske's position on Informational Philosophy relies on information and causation between the components of a whole to create experience,<sup>70</sup> which does not limit spatial distribution to the same degree. When looking at the inner components of an institutionalized state, there is certainly spatial distribution between the humans that give it function, thus a state fails the common definition of 'body'. However, by implementing Dretske's approach, the observation that there are significant levels of information and causation between humans becomes the primary driver of a state's 'experience,' allowing humans to be defined as the 'body' of the state contrary to more popular definitions.

Dretske's interpretation is further supported by split-brain studies. Many epileptic patients undergo a procedure where the corpus callosum, the part of the brain which connects the two hemispheres, is severed to prevent the spread of seizures from one area to another. Despite the success of the procedure, patients have what is called "split-brain syndrome" where he or she essentially has two separate consciousness, having two different experiences at the same time. For example, if a picture is inaccessible to one eye, the corresponding hemisphere is unaware of the picture's existence, even if it is clearly in view for the other eye. Subsequently, patients who are asked to describe what they see are unable to do so if the picture is not seen by the same eye that corresponds with the hemisphere responsible for speaking.<sup>71</sup> This is evidence that spatial contiguity is irrelevant; the two

<sup>69</sup> Bullock, Theodore Holmes. "Signals and signs in the nervous system: the dynamic anatomy of electrical activity is probably information-rich." *Proceedings of the National Academy of Sciences* 94, no. 1 (1997): 1-6.

<sup>70</sup> Dretske, Fred I. *Naturalizing the Mind*. Cambridge, Mass.: MIT Press, 1997.

<sup>71</sup> Bayne, Tim. "The Unity of Consciousness and The Split-Brain Syndrome." *The Journal of Philosophy*, 2008, 189-222.

hemispheres are still in the same proximity to one another, yet there exists two consciousnesses. Rather, the lack of information integration between the two hemispheres adequately explains why there is disunity.<sup>72</sup>

The issue of irreducibility can be easily dismissed by accepting scientific and philosophical approaches to consciousness. Both individual emotion and consciousness are considered to be irreducible yet structure-dependent in various neuroscientific frameworks, yet most scientists would fundamentally agree that its irreducibility does not make it inconsequential.<sup>73</sup> Consciousness still makes a difference when analyzing human interactions with the physical world, and as such, even if it cannot be proven, consciousness exists.<sup>74</sup> In IR discourse, conversely, debates over the existence of State Emotion are predicated on the ability to analytically reduce it to physical observations.<sup>75</sup> State Emotion qualifies as irreducible in the same way that consciousness does; consider that you cannot capture a thought within a single neuron just as you cannot define the emotions of an individual as a state emotion in itself. Even a leader must have the institutionalized support - forced, paid, or voluntary - of a portion of the polity in order to turn their individual emotion into a State Emotion.

Therefore, if the scientific ontology of consciousness - and often individual emotion - does not exclusively adhere to reductionist frameworks, then using theories of consciousness to support State Emotion allows for the same logical perception: that State Emotion is not dependent on adhering to a reductionist framework for it to exist. Additionally, State

<sup>72</sup> Tononi, Giulio. "Consciousness as integrated information: a provisional manifesto." *The Biological Bulletin*, 215, no. 3 (2008): 216-242.

<sup>73</sup> Barrett, Lisa Feldman, Batja Mesquita, Kevin N. Ochsner, and James J. Gross. "The Experience of Emotion." *Annual Review of Psychology* 58 (2007): 373.

<sup>74</sup> Tononi, Giulio. "An information integration theory of consciousness." *BMC Neuroscience* 5, no. 1 (2004): 1-22.

<sup>75</sup> Hutchison, Emma, and Roland Bleiker. "Theorizing emotions in world politics." *International Theory* 6, no. 03 (2014): 491-514.

Emotion has unique explanatory power over many interactions in the international world. This is related to philosopher Dan Dennett's conclusions, used for many arguments for human consciousness, on the ascription of beliefs and desires to any entity: if an entity is usefully describable as possessing beliefs and desires that embody a pattern of behaviors otherwise difficult to explain, then that entity, for all intents and purposes has beliefs and desires.<sup>76</sup> Through this philosophical notion, whenever State Emotion makes a difference to the behavior of a state, it essentially exists even if it cannot be proven to exist.

When comparing neurons and humans, it is also evident that representation and interpretation are essential components within each network's form of communication that give rise to their respective irreducible properties. Many State Emotion theorists often cite the inability for humans to represent their thoughts in a perfect manner, relying on cultural subtexts to understand one another, as a reason for why State Emotion can only exist through representation and not intrinsically.<sup>77</sup> This limitation has been used by skeptics and reductionists alike as an explanation for why State Emotion does not correlate perfectly with the individuals it can be reduced to.

When we look to studies in neuroscience, however, we can extend the non-reductionist argument that the role of interpretation is essential to the formation of emotion rather than an obstacle. Neurons communicate with one another through the release of chemicals and electrical discharges to represent information; furthermore, these chemical and electrical signals are not universally objective. Humans cannot perfectly understand the nuances of this information because we are not conditioned to understand the subtexts of these signals, so neuroscientists must rely on analyzing neurological activity with the corresponding group

<sup>76</sup> Dennett, Daniel C. "Real patterns." *The Journal of Philosophy*. 2008, 27-51.

<sup>77</sup> Bleiker, Roland. *Aesthetics and World Politics*. Basingstoke: Palgrave Macmillan, 2012.

(i.e. brain) behaviors.<sup>78</sup> These studies have found that neurons also interpret the chemical and electrical signals, rarely 1:1, even between other neurons that were formerly thought correlate perfectly. This interpretive barrier between neurons often causes inconsistencies in neural activity, further complicating the role of neural correlates with behavior. Purely objective definitions of specific signals are inaccessible, much like human communication.

For example, studies on memory recollection at the conscious level have also found that it is an imperfect system. Every time a memory is recalled, neurons release chemicals that are representative of certain traits of the memory, which are interpreted within the synapses of other neurons to essentially reconstruct the memory from scratch, in turn providing feedback to be restored within the originating neurons. The result is often a memory that differs from the original, if only slightly at first, and continues to degrade each time it is recalled.<sup>79</sup> This process explains why false memories develop within the brain, closely resembling the game of ‘telephone’ where a phrase gradually transforms into another over the course of multiple transfers. Understanding the ways that neurons transfer information allows for the key insight that neurons, while highly dependent on one another, are still fundamentally individual organisms that rely on communication to form the collective entity we define as the brain. If the brain can, indeed, give rise to consciousness despite the prevalent roles of representation and imperfect interpretation, then it stands to reason that a collective of humans would not be ontologically restricted by the same limitation.

<sup>78</sup> Bullock, Theodore Holmes. "Signals and signs in the nervous system: the dynamic anatomy of electrical activity is probably information-rich." *Proceedings of the National Academy of Sciences* 94, no. 1 (1997): 1-6.

<sup>79</sup> Swaminathan, Nikhil. "Partial Recall: Why Memory Fades with Age." *Scientific American*, December, 2007. Web.

## APPLICATION

Now that the considerations for using the Integrated Information Theory of consciousness have been thoroughly discussed, demonstrating the applicability, relevancy, and necessity of IIT in State Emotion theorizing, as well as providing scientific solvency for the obstacles to an ontology, the natural next step is to apply the theory to institutionalized states. I have chosen to focus on institutionalized states rather than any other type of international actor due to the consistency of such states having some degree of a distributed network structure, although this does not preclude other international actors with distributed network structures from being considered under the IIT model. My analysis is primarily based on the model of the Integrated Information Theory “3.0” that was released by Tononi, Oizumi, and Albantakis in 2014 although I also implement many of the arguments and observations from Tononi’s previous works for additional clarity.

### Establishing the IIT Model for IR Analysis

The central tenets of the IIT model are categorized by axioms, postulates, and an identity. The five axioms serve as fundamental assumptions that frame the central assertions addressed by IIT. These assumptions reflect on the nature of consciousness as experience, which are “to be immediately evident.”<sup>80</sup> and “cannot be doubted and do not need proof.”<sup>81</sup> The first axiom is existence, straightforward in that “*consciousness exists*” as an intrinsic

<sup>80</sup> Tononi, Giulio. “Integrated information theory of consciousness: an updated account.” *Archives italiennes de biologie*, 150, no. 4 (2012): 56-90.

<sup>81</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. “From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0.” *PLOS Computational Biology*, 2014.



aspect of reality. This is to be evident in that our consciousness makes a difference, thus necessitating its existence; if it didn't make a difference to theories of the physical world, then its existence wouldn't matter from a scientific perspective.<sup>82</sup>

The *Compositionality* axiom is that "Experience is structured, consisting of multiple aspects in various combinations," asserting that a single experience is made up of a multitude of senses and aspects, such as sight, sound and touch in a single moment that are all part of a whole.<sup>83</sup>

The *Information* axiom is that "Experience is informative or specific - in that it differs in its particular way from other possible experiences," meaning that every experience contrasts in some way from any other that has been previously experienced, will be experienced, or experienced through an infinite number of other perspectives.<sup>84</sup>

The *Integration* axiom asserts that "Experience is integrated - in that it cannot be reduced to independent components." This asserts that the composition of an experience is indivisible; for example, the sight of a red triangle cannot be seen as a triangle and a red patch separately.<sup>85</sup>

Finally, the *Exclusion* axiom is that "Experience is exclusive - in that it has definite borders, temporal, and spatial grain" which alludes to the fact that no two experiences can exist fully and simultaneously, either in time or space.<sup>86</sup> This final axiom is often used as part of a common argument for why IIT cannot apply to a collective of humans; subsequently, I will explain my case for its application to collectives, particularly states, under the analysis of the *Exclusion* postulate.

<sup>82</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>83</sup> Ibid.

<sup>84</sup> Ibid.

<sup>85</sup> Ibid.

<sup>86</sup> Ibid.

Tononi provides further explanation behind why each of these axioms are self-evident and essential in his previous frameworks, using a number of thought experiments to demonstrate their phenomenological significance. Even so, as the scientific acceptance of IIT within tiers of psychology, neuroscience, philosophy, and artificial intelligence theory has formally relied upon the conclusions of this axiomatic system,<sup>87</sup> there is a sufficiently reasonable ground for considering IIT in selective ontological investigations of IR theory, such as State Emotion.

### **The Initial Postulates of IIT**

The postulates of IIT are the at the heart of analytically attributing experience to states. The aim of this analysis is not to determine whether a state's experience is equivalent to that of a human, or that of any other living being; rather, it is essential for the hypothesis to prove that a state possesses *some* level of experience. If there is something it is like to be a state, then a state could have the ontological potential for emotion. In consequence, the burden of this section is solely to provide the reasoning for non-zero quantities within an institutionalized state for each of these postulates. Tononi's mathematical interpretations within each postulate provide a way to theoretically determine the specific grade of experience within an entity; howbeit, extensive network analysis applying these formulas should be relegated to future research since his equations will not be exhausted within this analysis.

Tononi developed five postulates that parallel each axiom. These postulates serve as "unproven assumption[s]... about the physical world and specifically about the physical substrates of consciousness... which can be formalized and form the basis of the

<sup>87</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

mathematical framework of IIT.”<sup>88</sup> In other words, these are the key ideas that “specify which conditions must be satisfied by physical mechanisms” to determine which distributed networks could, in principle, have a non-zero quantity of integrated information, and thus which entities possess a form of experience.<sup>89</sup> The first two postulates, *Existence* and *Composition*, question the nature of the system under analysis. The final three, *Information*, *Integration*, and *Exclusion*, each apply to both the individual mechanisms within the system as well as the system itself; consequently, each of these postulates require two different levels of analysis before they can be satisfied.

The *Existence* postulate asserts that mechanisms in the entity exist and that a system is defined as a set of mechanisms. IIT defines a mechanism as anything “having a causal role within a system, for example, a neuron in the brain, or a logic gate in a computer.”<sup>90</sup> In other words, there must be cause-effect power that exists intrinsically unto itself, otherwise the entire system is nothing more than a feed-forward system. Based on these parameters, an institutionalized state satisfies the *Existence* postulate; humans have a causal role within a state, and these humans individually change the probability of a multitude of inputs from becoming any one output, thus qualifying as the mechanisms that must exist within the entity.

The *Composition* postulate states “that elementary mechanisms can be structured, forming higher order mechanisms in various combinations.”<sup>91</sup> In other words, individual elements (elementary mechanisms) can potentially work together as pairs (second-order mechanisms) or as groups (third-order mechanisms), thus creating a “power set” of potential

<sup>88</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>89</sup> Ibid.

<sup>90</sup> Ibid.

<sup>91</sup> Ibid.

arrangement combinations, each of which must have cause-effect power to be considered a mechanism in itself. The power set of mechanisms A, B, and C is shown in Figure 2 (from Tononi 2014). In the case of institutionalized states, one human has the potential to structurally pair with another (a married couple filing taxes as a single entity, for example) or to become part of a group (on a committee, for example). Therefore, humans within an institutionalized state can and often form a variety of power sets, each with their own cause-effect power, that overall satisfies the *Composition* postulate.

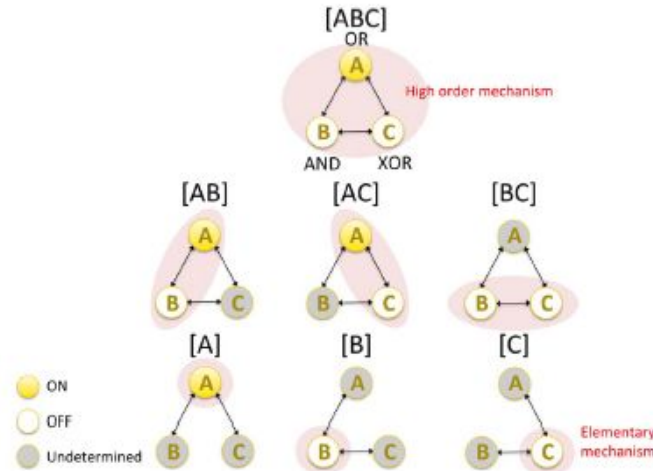


Figure 2. A Power Set of Three Mechanisms

## The Postulates Applied to Mechanisms

First I will discuss the postulates on the level of mechanisms before moving to the postulates as they apply to the system. The *Information* postulate as it relates specifically to mechanisms is analyzed through the calculation of “cause-effect information”, or cei. This conceptualization is designed to calculate the “differences that make a difference” from the

system's perspective.<sup>92</sup> Information is both causal and intrinsic, quantified “by considering how a mechanism in its current state constrains the system's potential past and future [actions].”<sup>93</sup> In other words, *cei* is a measure of how the presence of any particular mechanism determines the probability that the mechanism responds to particular causes on behalf of the system and the probability that the system will change from future effects created by the mechanism. Only mechanisms that create information can be a part of experience, since experience is constituted by information.<sup>94</sup>

For example, a pen used to write government documents is a causal mechanism, yet entirely deterministic with 0 *cei*. It always and exclusively responds to one scenario, a push, and always and exclusively leads to one effect, that of depositing ink in the exact spot the pen was pushed. Therefore the pen does not create any information within the system, despite having a causal role. On the other hand, the President of a country will have high *cei*, as he has a large cause repertoire of what he could react to on behalf of the state as a whole and he has a large effect repertoire of how he could change the behavior of the state through his choice of actions. The President as a mechanism definitely generates information within the state, as with other leaders, government officials, and voters. Therefore, the President can qualify as a mechanism that contributes to the experience of the state, whereas the pen that the President uses to sign a bill would not since it is merely feed-forwarding an output that is entirely determined by the President's input.

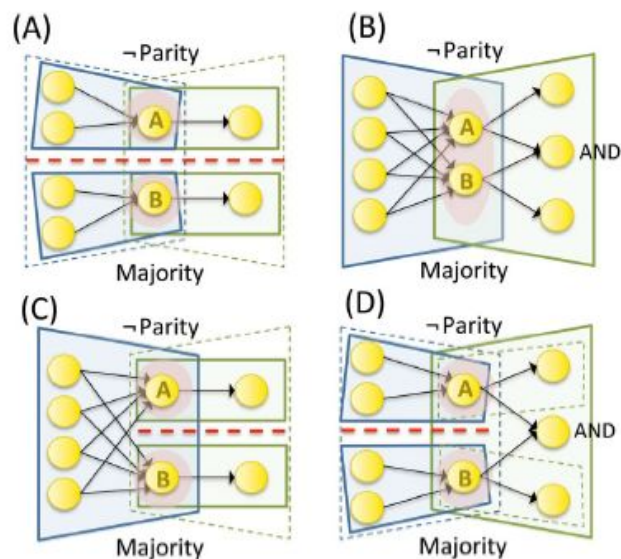
The *Integration* postulate examines the irreducibility of a mechanism itself or of the system to its mechanisms. This is done by quantifying integrated information, represented as

<sup>92</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>93</sup> Ibid.

<sup>94</sup> Ibid.

the Greek letters  $\Phi$  or  $\phi$ : “information that is generated by the whole... above and beyond the information generated by its parts.”<sup>95</sup> For individual mechanisms, this postulate imposes that “mechanisms that do not generate integrated information do not exist from the intrinsic perspective of a system.”<sup>96</sup> This mechanical notion, represented as  $\phi$  and referred to as “small phi,” is best understood when each mechanism is partitioned to measure the changes in the *cei* as illustrated by Figure 3 (from Tononi 2014). Figure 3B demonstrates how elements A and B generate integrated information because both share at least one element from the cause repertoire and both share at least one element from the effect repertoire; therefore, partitioning the two would cause a loss of information. In this example, mechanism [AB] would exist intrinsically from the perspective of the system.



**Figure 3. Examples of Partitioned Mechanisms**

<sup>95</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>96</sup> Ibid.

In the case of a state, for example, we can associate a senator and a representative from the same local county as a second order mechanism. Many of the same voters will have the potential to influence the response of both congressmen, and both congressmen could respond by passing a joint government action exclusively requiring both of their participation. Despite the fact that the two individuals may have never directly interacted with one another, they are part of the same mechanism entirely because they generate integrated information in their cause-effect repertoires. Like mechanism [AB], the combination of these two congressmen are considered to be a mechanism that “exists from the intrinsic perspective of the system, in the sense that it plays an irreducible causal role; it picks up a difference that makes a difference to the system in such a way that cannot be accounted for by its parts.”<sup>97</sup>

If the two congressmen did not have the option to pass a joint government action, then the integrated information about the future generated by that possibility would be lost, as shown by Figure 3C. The mechanism of the two congressmen would cease to exist intrinsically since the support of the same constituency makes no difference in the future of how the congressmen will change the system. If both were senators, consequently influenced by entirely different voting pools, the past integrated information from the cause repertoire would be lost, as shown by Figure 3D. In this case the mechanism would not exist intrinsically because there is no similarity in the input, and thus the input could not influence the current intentions of the senators in a shared way. If we were to associate a senator with a foreign businessman, the combination would be an entirely reducible mechanism as both would respond to entirely different elements and both would make entirely different

<sup>97</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

decisions. Namely, as seen in Figure 3A, associating the two would not yield any information about the past or future to determine whether there are “differences that make a difference” between them. As partitioning them would not change their *cei* from the intrinsic perspective of the system, their  $\phi = 0$ , and the association as an integrated second order mechanism would not constitute any part of the state’s experience, even if they interacted directly with one another.

The *Exclusion* postulate as it relates to mechanisms asserts that “a mechanism can have only one cause and one effect, those that are maximally irreducible.”<sup>98</sup> In this context, the postulate is referring to the *core cause* and *core effect*, which refer to sets of causes and effects. In other words, a mechanism that contributes to experience cannot have an infinite number of causes and effects, as cause and effect must be limited to the smallest set of elements as possible. The existence of a maximally irreducible cause-effect repertoire (“MICE”) determines which mechanisms are foundational to the state’s experience versus the mechanisms that are merely components or collections of other mechanisms.<sup>99</sup> These foundational mechanisms have an additional term to signify their importance in future analysis: “*concepts*.”

As a thought exercise, if the Supreme Court was to be defined as a concept, then, for an over-simplified description, the association of the nine justices would constitute a higher order mechanism while the maximally irreducible set of causes would include the two persuasive arguments of each lawyer and the maximally irreducible set of effects would be the decisions to either uphold or overturn a lower court. As it currently stands, the number of potential lawyers who could deliver persuasive arguments to the Court is consistently

<sup>98</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>99</sup> Ibid.



limited to two, and as such there is one core cause since the set will always be two. Hypothetically, if *all* of the members of the Supreme Court Bar Association addressed the Court, so long as this arrangement remained consistent for every trial, that would also count as one core cause. This breaks down when the number is inconsistent; if any number of lawyers could address the Court over the course of any number of trials, then the set of potential causes per trial would include  $\{2, 3, 4, 5 \dots N\}$  where N is the maximum amount of lawyers available. This would entail more than one core cause; subsequently, the exclusion principle would determine that the Supreme Court is not intrinsic defined as a *concept*, either consolidated into a larger *concept* or split into multiple *concepts* depending on the strength of integration between the lower and higher order mechanisms.

### **The Postulates Applied to Systems**

The examination of an institutionalized state clearly indicates that many of its internal mechanisms can satisfy each postulate to at least a minimal degree; thus, the postulates must now be applied to the state at a systemic level. Instead of looking at the mechanisms of a state, these postulates follow the relationships between *concepts*. Similar existing social theories on agency further emphasize the importance of these postulates for collective behavior. This begins with the *Information* postulate; “only sets of ‘differences that make a difference’... matter for consciousness.”<sup>100</sup> “Conceptual Structures” are the sets referenced by this postulate, composed of *concepts* that a system is divided into. The differences that each conceptual structure makes is calculated in regards to CI, or “Conceptual Information,” which is simply the translation of “Cause-Effect Information” to *concepts*. Thus the extent to which a system can satisfy the *Information* postulate is determined by the interactions of

<sup>100</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

multiple *concepts* in a cause-effect paradigm. In other words, if any one of multiple *concepts* can influence the current order of a single *concept*, a change in which could subsequently influence any one of a variety of other *concepts*, then there is CI within the system. In terms of an institutionalized state, for example, any lower court decision can influence a higher court to make a decision, and the higher court's decision could influence the lower courts or a higher court to make the same or alternative decisions.

This is captured well in the existing sociological theory of organic and mechanical solidarity, proposed by Émile Durkheim. Durkheim introduced the terms "Mechanical Solidarity" and "Organic Solidarity" to categorize the different types of societies that exhibit what he refers to as “conscious collective”. Mechanical Solidarity represents a society which is connected through similarities such as religion or lifestyle, and often operates in small scale societies. Organic Solidarity, conversely, represents the interdependence of complimentary work specializations and personalities, which operates in more advanced, industrial societies.<sup>101</sup>

In accordance to this theory, societies with Mechanical Solidarity have low levels of “conscious collective” while societies with Organic solidarity have high levels.<sup>102</sup> This assertion can be supported by analyzing each system within the context of the *Information* postulate of IIT. Mechanical Solidarity, due to the uniformity between each individual with no specialized interconnections, would have a low level of differentiation. Namely, interactions within such systems would be limited in how much of “a difference that makes a difference” it has on the system as a whole. Organic Solidarity, on the other hand, emphasizes specialized connections between a wide range of individuals; subsequently, the

<sup>101</sup> Durkheim, E., and W. D. Halls. *The Division of Labor in Society*. New York: Free Press, 1984.

<sup>102</sup> Ibid.

interactions within these systems have much larger cause-effect repertoires and would generate high levels of information according to IIT.

The *Integration* postulate asserts that “only conceptual structures that are integrated can give rise to consciousness”<sup>103</sup> when analyzing the system. This can be determined by “partitioning a set of elements and measuring *integrated conceptual information*  $\Phi$  as the difference made by the partition”<sup>104</sup> similar to the method of determining “small phi” at the level of mechanisms. This time, though, there are three possibilities; in addition to either having integration or not having any integration at all, there is the possibility of having “weak” integration.<sup>105</sup> This is demonstrated in Figure 4. Figure 4A shows that a partition between the *concepts* makes no difference to the system, therefore that system is not integrated. Although the system can be seen as a whole from the perspective of an observer,  $\Phi = 0$ , and the system does not exist as a whole intrinsically. Figure 4B shows a strong integration between the *concepts* because they each influence one another’s cause and effect repertoires, and thus have the highest quantity of  $\Phi$  out of the four examples. Figures 4C and 4D demonstrate unidirectional connections, which qualifies as weak integration because there is no opportunity for feedback between the two *concepts*, which reduces awareness.<sup>106</sup> Feedback is necessary to become an “integral” part of the system, thus, 4C and 4D are examples of “appendix” relationships.<sup>107</sup>

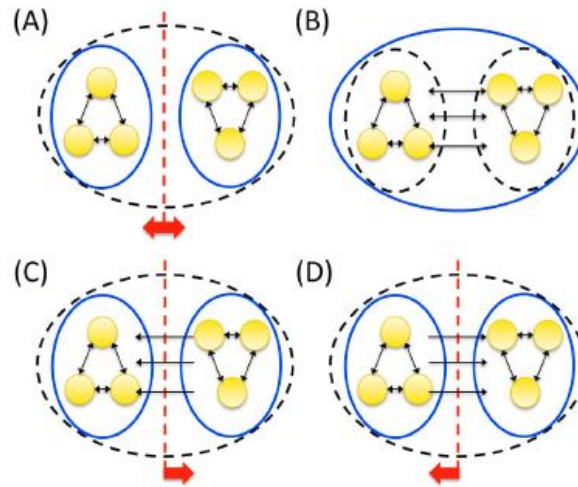
<sup>103</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>104</sup> Ibid.

<sup>105</sup> Ibid.

<sup>106</sup> Lamme, Victor AF. "Why visual attention and awareness are different." *Trends in Cognitive Sciences* 7, no. 1 (2003): 12-18.

<sup>107</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.



**Figure 4. Systems with Various Levels of Conceptual Information Integration**

The analogy that Tononi provides in the most recent incarnation of IIT accurately demonstrates the relationship at the human level: “As an analogy, take the executive board of a company. An employee who transcribes the recording of a board meeting is obviously affected by the board, but if he has no way to provide any feed-back, he should not be considered an “integral” part of the board, which has no way of knowing that he exists and what he does. The same obtains for an employee who prints the agenda for the board meeting, if the board has no way of giving him feedback about the agenda.”<sup>108</sup>

The measure of integration is essentially equivalent to List and Pettit’s notion of “constitution,” which is deemed to be the key difference between set-wise and proposition-wise models. List and Pettit’s definition of constitution entails a set of rules, implicit or explicit, which determine the order that interconnected individuals form a group judgment from individual contributions.<sup>109</sup> To demonstrate the need for constitution, they use the example of a group of people at a subway stop. In theory, they are part of a group

<sup>108</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>109</sup> List and Pettit. “Group Agency and Supervenience.” *Southern Journal of Philosophy*, XLIV (2006): 85-105.

who are in close proximity and share a similar identity as subway users. Nonetheless, this group does not exhibit agency in practice. List and Pettit assert this is because the group lacks a constitution by which the information within the individuals could be collected to create a group output.<sup>110</sup> This interpretation of constitution is focused on the extent of potential interactions, or the size of the cause-effect repertoire in IIT, in determining whether or not intentions can emerge from particular groups. The *Integration* postulate makes nearly an identical analysis in determining the emergence of experience by focusing on the potential interactions of a conceptual structure.

### **Limitations Imposed by the Exclusion Postulate**

The *Exclusion* postulate at the systemic level carries many implications that scholars use, including Tononi himself,<sup>111</sup> to dismiss the application of IIT to the collective level. I will first present how the postulate is used in IIT before presenting my argument for why this logic may not preempt states from qualifying as *complexes* with intrinsic experience. The *Exclusion* postulate asserts that “only a conceptual structure that is maximally irreducible can give rise to consciousness - other constellations generated by overlapping elements are excluded”<sup>112</sup>

A *complex*, therefore, is the “set of elements within a system that generates a local maximum of integrated conceptual information  $\Phi^{\text{Max}}$ ... Only a *complex* exists as an entity from the intrinsic perspective of the system.” In other words, a *concept* within a system can possess consciousness if and only if it has the highest comparable amount of  $\Phi$  to all other sets that have overlapping elements; when that is the case, the *concept* is referred to as a

<sup>110</sup> List and Pettit. “Group Agency and Supervenience.” *Southern Journal of Philosophy*, XLIV (2006): 85-105.

<sup>111</sup> Tononi, Giulio. “Integrated information theory of consciousness: an updated account.” *Archives italiennes de biologie*, 150, no. 4 (2012): 56-90.

<sup>112</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. “From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0.” *PLOS Computational Biology*, 2014.

*complex*. Figure 5 (from Tononi 2014) Figure 6 (from Tononi 2008) and Figure 7 (From Tononi 2014) each demonstrate different variations of analysis for the *Exclusion* postulate. In Figure 5, set [ABC] is the *complex* since it has  $\Phi^{\text{Max}}$  in the available system; that is, it has the highest level of integrated information and would be the conscious entity from the power set. Figure 6 shows a full system with overlapping sets of elements; *Concept* (a) creates the consciousness for the system as it has  $\Phi^{\text{Max}}$ . Figure 7 has a variety of different types of *complexes*, the phenomenon of which will be explained in later analysis.

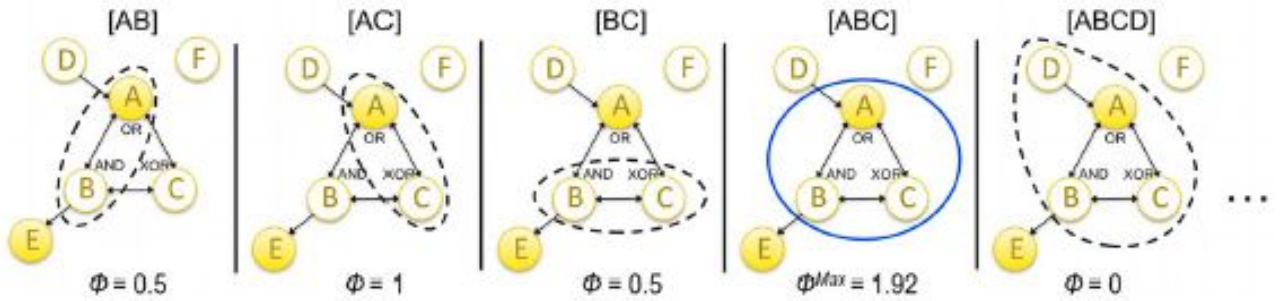


Figure 5. Comparisons of  $\Phi$  Within Power Set ABCDEF

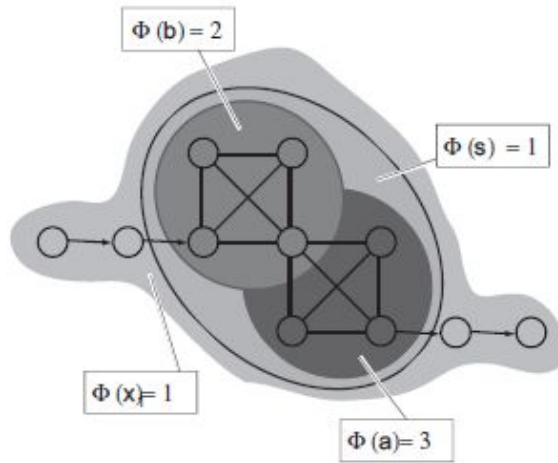


Figure 6. A System With Overlapping Concepts

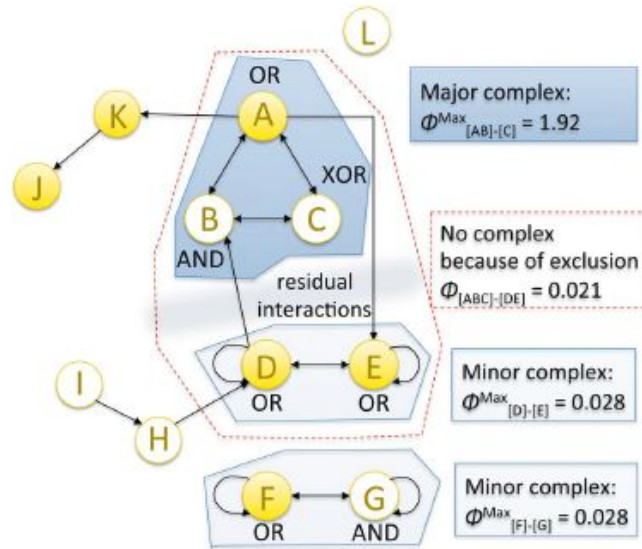


Figure 7. A System With Non-Overlapping Concepts

The *Exclusion* postulate is argued to be important for consciousness since an experience needs to have definite borders, which creates an issue when the universe is both infinitely microscopic and infinitely macroscopic. The potential of infinite scales of analysis enables the assumption that there are an infinite number of networks that could produce a non-zero quantity of  $\Phi$ , alluding to panpsychism. In response, when a subsystem integrates its information more than a higher system, the elements that are tied to the integrated information become less accessible to the higher system, consequently decreasing the cause-effect repertoire of the higher system (and with it, decreasing its intrinsic ability to “make differences that make a difference”).<sup>113</sup>

By limiting consciousness to the local maximum and avoiding a panpsychist conjecture, Tononi overcomes this issue by limiting the scale of analysis to the most relevant structure. When analyzing neural structures, this is an insight that makes IIT much more realistically

<sup>113</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

manageable for neuroscientists. In the brain, studies have found that the cerebrum of the brain is the only integral part of the human brain for our conscious awareness, yet the cerebellum still provides important information to the cerebrum. In addition, the cerebellum has a non-trivial amount of  $\Phi$ , meriting the potential for consciousness even though the cerebrum has  $\Phi^{\text{Max}}$ .<sup>114</sup> Be that as it may, while someone can continue to exist without their cerebellum, albeit with physical difficulties, patients with damage solely to their cerebrum fundamentally change in personality or cease to exist as psychological person, consequently entering a vegetative state.<sup>115</sup> The *Exclusion* postulate accounts for this observation by allowing for both entities to exist in the same neural system while having different effects on the consciousness of the individual. Since information is maximally integrated in the cerebrum, that part of the brain consistently contains the consciousness of the system.

To account for non-overlapping entities with non-trivial quantities of  $\Phi$ , the notion of “*minor complexes*” was developed.<sup>116</sup> The relationship between major and *minor complexes* from within the system is shown in Figure 7, in contrast to the overlapping *concepts* in Figure 6. Tononi suggests that the “condensation into major and minor complexes may be relevant also for much more complication systems of interconnected elements.”<sup>117</sup> These *minor complexes*, by their nature, are inaccessible to our own consciousness; though while most psychologists would refer to these regions of the brain as “unconscious,” Tononi prefers the term “paraconscious” since they are, in effect, minimally conscious.<sup>118</sup> The presence of *minor complexes* can explain the substantial complexity of subconscious

<sup>114</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>115</sup> Parkins, E. J. "Cerebellum and cerebrum in adaptive control and cognition: a review." *Biological cybernetics* 77, no. 2 (1997): 79-87.

<sup>116</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>117</sup> Ibid.

<sup>118</sup> Ibid.



processes, which are heavily theorized in psychology yet functionally indistinguishable from conscious thoughts examined in neuroscientific studies.

By limiting consciousness to the local maximum of  $\Phi$ , however, a *complex* cannot operate within any other *complexes*, preventing the superposition of *complexes*. Since Tononi knows he is conscious (and assumes all humans like him are as well), then Tononi's conclusion is that humans are *complexes*, and as such, no shared elements of humans can be conscious.<sup>119</sup> This implies that neurons themselves cannot be conscious, and it implies that collectives of humans - including states - cannot be conscious.<sup>120</sup>

### **The Necessity of a Flexible Interpretation**

In order for a state to possess experience for my argument, the *Exclusion* postulate must be reinterpreted. Tononi's interpretation relies on a few conjectures that are not fundamentally supported, which I argue enables a more flexible approach to exclusion. The arguments associated with these conjectures offer the potential for inaccuracies, as some are based upon the dependence on his own personal experience, thus avoiding the inclusion of ontologically inaccessible experiences. Additionally, circumstances such as the co-existence of more than one *major complex* in any integrated society are contradictory to the notion of exclusion, thus suggesting that the postulate is not universal.

First, as Tononi himself pointed out, this is the only postulate that relies strictly on his own personal experience. In response to questions he received on the notion of exclusion during his lecture at a panpsychism workshop, "It is just that my consciousness is like that, there is only one... There might be all kinds of other stuff in the world; we are dealing with

<sup>119</sup> "Giulio Tononi & Larissa Albantakis at ASSC18: Panpsychism Workshop (July 2014)," Youtube video, 2:16:47, posted by "Tsuchiya Lab," November 12, 2014, <https://www.youtube.com/watch?v=hE-gGAyXpAs>.

<sup>120</sup> Tononi, Giulio. "Integrated information theory of consciousness: an updated account." *Archives italiennes de biologie*, 150, no. 4 (2012): 56-90.

consciousness and the only consciousness I know about, strictly speaking, is mine. I assume yours is similar... Mine is always one, not a superposition.”<sup>121</sup> Framing the argument for exclusion in this way neglects the very nature of emergent properties. We can leave aside the implications of solipsism in favor of more relevant inquiries; how could he determine the instances when he is experiencing a part of a collective whole, and since  $\Phi$  often fluctuates, could he be intrinsically aware of the times that he is not “one”?

As previously established, IIT subscribes to an emergence-based view of the world, and as such, consciousness is more than the sum of its parts. If this is the case, then each individual mechanism that is a part of the consciousness does not internally possess its full contribution to the whole. There is at least some contribution that cannot be accounted for through the reflection of the self; Tononi may never have experienced what it is like to be a collective, but that could simply imply that, as an individual, the collective is inaccessible to him. For example, as it takes multiple neurons to process the color red, a single neuron could never be able to understand red. There is a non-zero quantity of  $\Phi$  in a neuron, so theoretically, if separated by a vacuum from all other mechanisms, the neuron would have  $\Phi^{\text{Max}}$  and be able to experience red. All the same, without any non-collective way to “see,” the entire notion of color would be ontologically inaccessible to the neuron, making it entirely impossible to have memory of red. With this logic, how could Tononi even conceive of any one component of collective experience? A related scientific argument exemplifies this point further on the human scale: the analysis of dimensional space. We can only experience three dimensions of space; mathematicians can implement more than three dimensions of space in their calculations, thus “proving” its existence, yet the closest that

<sup>121</sup> “Giulio Tononi & Larissa Albantakis at ASSC18: Panpsychism Workshop (July 2014),” Youtube video, 2:16:47, posted by “Tsuchiya Lab,” November 12, 2014, <https://www.youtube.com/watch?v=hE-gGAyXpAs>.

even they can come to conceiving a 4<sup>th</sup> dimension of space is to draw various forms onto two or three dimensional spaces.<sup>122</sup> According to the *Integration* axiom of consciousness, an experience is indivisible; therefore, the experience of a 4<sup>th</sup> dimension of space will always be ontologically inaccessible, despite its potential existence.

Additionally,  $\Phi$  is not constant through time. The only guarantee of  $\Phi^{\text{Max}}$  is that “At any given time, you exist at that time scale” though “that time scale may actually shrink and expand a bit.”<sup>123</sup> An example of this is during sleep; a human brain undergoes multiple fluctuations of integrating information, and the dreamless sleep someone “experiences” is an example of a decrease of  $\Phi$  in the cerebrum.<sup>124</sup> Subsequently, humans are only aware of dreamless sleep extrinsically, in that they must wake up to acknowledge that they had an absence of experience relative to a noticeable time span. Theoretically, if a human had a quick and steep decline of  $\Phi$  that lasted for merely milliseconds, they would not notice as a typical clock would be unhelpful and it would be unfeasible to discover something that had occurred within that time span. Therefore, knowledge of our own fluctuations of  $\Phi$  is limited to our perception of time, and Tononi could not be intrinsically aware of all the potential instances that he has not been “one”, either divided within his own brain or part of a larger whole. Thus, his dependence on personal experience, due to the ontological inaccessibility of alternative experiences, does not provide strong evidence for his current interpretation of the *Exclusion* postulate.

Second, the *Exclusion* postulate calls into question why there is more than one *major complex* in optimally macro-level systems. To extrapolate, we can refer to split brain patients

<sup>122</sup> Bryanton, Rob. *Imagining the Tenth Dimension: A New Way of Thinking about Time and Space*. Victoria, B.C.: Trafford, 2006.

<sup>123</sup> “Giulio Tononi & Larissa Albantakis at ASSC18: Panpsychism Workshop (July 2014),” Youtube video, 2:16:47, posted by “Tsuchiya Lab,” November 12, 2014, <https://www.youtube.com/watch?v=hE-gGAyXpAs>.

<sup>124</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. “From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0.” *PLOS Computational Biology*, 2014.

and then to society as a whole. In split brain patients, two conscious *major complexes* are created side-by-side; Tononi agrees with this assertion, positing that in these rare cases, a system can have two *major complexes* rather than forcing one into becoming a *minor complex*.<sup>125</sup> Notwithstanding, since they do share a body, each half still has some residual interactions with the other, producing a tiny non-zero quantity of  $\Phi$ , and thus both remaining in the same system. In theory, the fluctuation of  $\Phi$  at unpredictable and inconsistent intervals would imply that, at some point, one *complex* would have  $\Phi^{\text{Max}}$  over the other, thus making one of them a *minor complex* for an undetermined period of time. Regardless, Tononi holds that they coexist with  $\Phi^{\text{Max}}$ ,<sup>126</sup> which violates the *Exclusion* postulate.

Society as a whole can fit the definition of a system just as a brain does, as exemplified in my analysis of the *Existence* postulate. Yet, according to the *Exclusion* postulate, only the *concept* with  $\Phi^{\text{Max}}$  in a system can be conscious, and all others must become paraconscious. This would imply that only one individual, confirmed as a *complex*, could have consciousness in an integrated society; everyone else would cease to intrinsically exist. We could all adopt solipsism and agree that only one of us truly exists; or, more reasonably, we can agree that this is an error in the *Exclusion* postulate as it is currently applied.

### **A Case for the State as a Complex**

The Exclusion axiom fulfills a theoretical gap in determining borders for experience, which is essential to any theory of consciousness. Subsequently, rather than dismissing the corresponding postulate, I will use a more flexible approach that leaves more rigorous reevaluations of the combination problem to be theorized and tested among phenomenology

<sup>125</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

<sup>126</sup> Ibid.

researchers. I will assert first that institutionalized states have the potential to have  $\Phi^{\text{Max}}$  under certain circumstances, and second, that, even as a non-major *complex*, it could still have the minimal grade of experience necessary for emotion.

As previously discussed,  $\Phi$  is not a constant quantity since the potential causal interactions often change with time in any system. The possibility for individuals to lose their  $\Phi^{\text{Max}}$  to smaller *concepts* during sleep simultaneously opens the possibility for individuals to lose their  $\Phi^{\text{Max}}$  when the state theoretically “wakes up.” Due to fluctuations in  $\Phi$  in both collectives and individuals, there could feasibly be a point of time in which an individual’s  $\Phi$  decreases at the same moment that the collective’s  $\Phi$  increases. Regardless of the likelihood that it would only be sustained for an inconceivably short amount of time, the occurrence of this phenomenon could still theoretically provide a state with an intrinsic, collective experience. If the state is properly structured, and there is a motivation among the population to integrate themselves within the structure, then the likelihood of this phenomenon repeating would increase with the integration with the state, providing more sustained experiences. From the perception of the state, time may not be evident, and thus its experience would appear to be continuous just as our own individual experiences would appear continuous even if they are intermittently interrupted by inconceivably small periods of time.

Even if this phenomenon couldn’t regularly occur, states could still feasibly have a minimal grade of experience to give rise to State Emotion. When analyzing the human brain, the structure known as the amygdala would only qualify as a paraconscious *minor complex*. Yet, it has a largely influential role in our daily lives; it has particular relevancy in this case, often referred to as “the emotional brain.” The amygdala provokes somatic feelings in the

body to communicate the need for a certain emotion, in turn taking feedback from the other parts of the brain, particularly the hippocampus which processes and controls emotions.<sup>127</sup> Additionally, the amygdala is believed to be integral in emotional recognition and emotional memory recollection. Despite this integral role, however, the amygdala is not essential for the whole of consciousness. Humans continue to maintain a sense of self when it is removed. Instead, the somatic experiences of emotion are removed; and thus, many emotions such as fear become ontologically inaccessible to these patients.<sup>128</sup> If we can accept the notion that a *minor complex* can still have enough intrinsic experience to give rise to emotions within a brain despite not having  $\Phi^{\text{Max}}$ , then similar levels of  $\Phi$  within a state could theoretically do the same regardless of the position of the local maximum.

<sup>127</sup> Zola-Morgan, Stuart, Larry R. Squire, Robert P. Clower, and Pablo Alvarez-Royo. "Independence of memory functions and emotional behavior: separate contributions of the hippocampal formation and the amygdala." *Hippocampus* 1, no. 2 (1991): 207-220.

<sup>128</sup> Maynard, James. "Want to Be Fearless? Get Rid of Amygdala Neurons in the Brain." *Tech Times*, November 1, 2014. Web.

## IMPLICATIONS

Implementing the postulates of Tononi's Integrated Information Theory into international relations has demonstrated many state structures are causally similar to the structures of the human brain that, through causal emergence, form the basis for individual emotions. Although the *Exclusion* postulate complicates the analogous nature of this analysis, it can be reasonably circumvented by simply establishing the *potential* for a state to be a *complex*, as it is not necessary to empirically prove that any irrefutably *are*. The aim of this analysis was not to determine whether a state's experience is equivalent to that of a human, or that of any other living being; rather, for the sake of the hypothesis, the burden was to prove that a state possesses *some* level of experience. Indeed, I was able to establish, through the tenets of IIT, that institutionalized states have non-zero quantities of  $\Phi$ , and thus, non-zero potential for experience.

By making this association, I can return the focus to my hypothesis: that the existence and function of State Emotion is not from the aggregation of individuals; rather, it is a structural process. This is established through two premises; first, that accepting institutionalized states as distributed networks and emotion as a causally emergent characteristic of intrinsic experience are key components to establishing the ontology of State Emotion, and second, that conjoining the processes of experience (intrinsically provided through IIT) with feelings (by establishing a theory of State Feeling) allows for more explicit theorizing regarding the political function of State Emotion.

## **Foundations for an Ontology of State Emotion**

When Bleiker and Hutchison defined the central challenge to State Emotion, namely, “to theorize the processes that turn individual emotions collective, social, public, and , thus, political,” their main concern revolved around the ontological existence of State Emotion. Mainstream theorists often question the credibility of State Emotion to explain political behavior because it has not been physically observed or mechanically deduced; rather, it is implied or asserted as a causal link in analyses, often when it is convenient to look at the population as a cause for irrational decisions. This inability to directly observe the phenomenon weakens the argument for its existence, especially since the proponents of State Emotion cannot agree over how it ties into the nature of collectives, or even universally posit specific traits that constrain its seemingly ethereal existence.

In light of this problem, Brent Sasley accurately asserts that “more explicit propositions about individual-to-group emotions transference will help make theorizing about states’ (or other group actors’) emotions more rigorous.”<sup>129</sup> Providing an explicit ontological foundation for its existence, thus enabling its reliable use in more rigorous frameworks, will improve State Emotion as a tool for IR analysis; otherwise, it could feasibly be relegated to *ex machina* arguments for unpredictable or irrational decisions, potentially harming rather than expanding IR theories.

The ontological foundation that is necessary for State Emotion to advance in mainstream IR discourse is firmly established through the implications of applying Integrated Information Theory alongside a theory of State Feeling, in accordance to the analysis provided in previous sections of this thesis. In summary, to establish this ontology,

<sup>129</sup> Sasley, Brent E. "Theorizing States' Emotions." *International Studies Review*. 13, no. 3 (2011): 452-476



institutionalized states must be understood as distributed networks and emotion must be understood as a causally emergent characteristic of intrinsic experience. Building from these understandings, IIT establishes that any distributed network has the potential to have experience, in that there is something it feels like to be the network. Therefore, the state as a distributed network has the potential to have intrinsic experience. This experience is what subsequently gives rise to State Emotion through causally emergent processes within the context of State Feeling.

Through this line of reasoning, states certainly possess the ontological capability to have actionable State Emotion. The explicit implementation of IIT and similar structural theories throughout State Emotion discourse ought to become fundamental to potentially strengthen its prevalence in mainstream IR. Although this foundation now provides a basis for rigorous theorizing, the secondary concern in Bleiker and Hutchison's challenge was to determine why State Emotion is not universal; to theorize the processes that enable some collective emotions to become political, actionable at the level of decision-making, while relegating others to be either ineffectual or ignored. This necessitates the formation of a methodology to determine the extent to which State Emotions apply under particular circumstances, which must also be capable of being used under rigorous frameworks.

### **A Consistent Methodology for Analysis**

Contextual framing is often integral to experimental methodologies in the social sciences. Objective measures are nearly impossible to obtain without accounting for the majority of variables, which is a substantial task when it comes to subjective phenomena such as emotion. This is why most micro-theorists in State Emotion research opt for analyzing historical accounts placed in context with studies in psychology. However, this

approach is often limited and inconsistent between studies. While analyzing the context of State Emotions in previous circumstances have yielded valuable hindsight for past state behaviors, the current repertoire of these specialized analyses does not bring the field much closer to finding a universal analytical framework in predicting future behaviors, especially those that are predicated on under-theorized avenues for emotion.

The mathematical model provided by Tononi's Integrated Information Theory provides an uniquely explicit and rigorous methodology for State Emotion analyses. Although it is not purely objective when applied in this context, the model still provides a fully consistent and theoretically reliable measure that can be used for meta-analyses of IR studies in addition to new inquiries. By focusing on the key elements necessary for the rise of experience, a better understanding of the extent to which State Emotions drive political intentions and behaviors can be gained from cross-study and cross-subject comparisons.

There are two contexts that should both be present at any one point of a state's decision-making process in order to provide an optimal account of the model's predictability: the level of institutionalization within the state and the freedom of the populous to express State Feelings. The level of institutionalization alludes to the extent to which information within the system is both integrated and differentiated. This can be accomplished either through explicit contracts that enforce a process of multiple specialized interactions to produce a result, or it can naturally occur as a de facto structure. For the ease of analysis, focusing on explicit contracts, the foundations of many institutions within and including states, are the most relevant contexts for this model's power of predictability.

Despite its integral role, institutionalization will not yield any emotional outcomes if there is no internalization of State Feeling. While any feelings can potentially be linked to

decision-making, regardless of whether they originate from the populous, the leaders, or interest groups, not all feelings can provide insight through the IIT model. Subsequently, the most applicable circumstances for the model to provide predictability are those where State Feelings form and are accessible to the leaders. This often requires some degree of freedom of speech and freedom of assembly; without the ability for individuals to openly communicate their feelings to form State Feelings and for similar individuals to join together and demonstrate those feelings to make them accessible to the leaders of the state, then any decisions made by the leader are independent from State Feeling. This does not require full degrees of these freedoms; rather, simply having *some* capability to communicate feelings can lead to the formation of State Feeling. The strength and prevalence of a State Feeling, therefore, will be limited to the extent of expressive freedoms within a state.

Crawford uses the contexts of institutionalization and freedom of expression very effectively in her analysis of fear.<sup>130</sup> The examples that she uses to explain the effects of collective fear in decision-making are highly institutionalized states that, although oppressive in many respects, maintained some level of expressive freedoms that allowed the emotions of the populous to be salient. In these contexts, Crawford could potentially use the IIT model to provide predictions on whether or not these states will continue to make decisions based on fear, and if so, to theorize the environmental conditions that will sway the influence of fear under specific circumstances.

Once the contexts for the model have been established, State Emotion theorists can proceed to apply the model. The resulting calculations can be applied for relative determinations of State Feeling's influence on State Emotion, which can then provide insight

<sup>130</sup> Crawford, Neta C. "Institutionalizing Passion in World Politics: Fear and Empathy." *International Theory* 6, no. 3 (2014): 535–57.

on the underlying motivations behind certain political behaviors. The IIT model does not calculate directly whether or not a particular decision will be made; rather, it enables discussion on the likelihood that future decisions will be linked to State Feelings. To explain, it is important to remember that experience has various grades rather than existing as an absolute trait.<sup>131</sup> Therefore, the calculations of the IIT model apply in the form of correlations; states with lower grades of experience will have weak correlations of State Feeling to State Emotion and Behavior while states with higher grades of experience will have strong correlations. Correlations are used for predictions when causal linkages are imperfect, remaining more accurate than conjecture alone yet not to be taken as absolute certainties; therefore, the IIT model can still be considered a rigorous analytical tool.

The IIT model can also be conceptually reversed to determine which sub-mechanisms of a state are optimally integrated - perhaps through implicit rather than explicit institutionalization - with the state. This can be done by retroactively determining how *often* particular non-state entities have translated State Feelings into behaviors; those with a substantial record of associations can be considered to be more integrated with the experience of a state than those with no record. Since only integrated *concepts* can take part in the emergence of experience, and maximizing the integration maximizes the role of the *concept*, it is clear that the frequency of associating State Feelings into behaviors, done through the experience of the state, is limited by the integration of the entity. The potential insights from reversing the model can be subsequently utilized for determining contexts for future State Emotion analyses; by discovering which entities are maximally integrated, the application of the IIT model can be optimally predictive for these entities.

<sup>131</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

## CONCLUSION

The field of State Emotion offers many insights into the behaviors of state actors, despite the natures of emotion and intention as attributes of persons. The ‘emotional turn’ in IR discourse has the potential to re-conceptualize the very processes of state-level decision-making. However, before State Emotion can be considered a reliable analytical tool, there are multiple obstacles that must be overcome to demonstrate its core ontology. Providing a theoretical foundation for its existence will justify the analysis of State Emotion, the lack of which currently prevents the formation of a rigorous and consistent methodology.

The purpose of this thesis, therefore, is to address these obstacles to answer what Bleiker and Hutchinson summarize as the central challenge to State Emotion research: to theorize the processes that turn individual emotions collective, social, public, and , thus, political. This challenge entails an explanation of *how* these emotions are manifested in state-decisions and the need of a model for IR scholars to determine the *extent* of State Emotion’s influence under particular circumstances. To satisfy this purpose, my hypothesis proposed that the existence and function of State Emotion is not from the aggregation of individuals; rather, it is a structural process. This was established through two premises; first, that accepting institutionalized states as distributed networks and emotion as a causally emergent characteristic of intrinsic experience are key components to establishing the ontology of State Emotion, and second, that conjoining the processes of experience with feelings allows for more explicit theorizing regarding the political function of State Emotion.

It is with this intent that I brought the Integrated Information Theory of consciousness (IIT) into the discussion and formulated my own theory of State Feeling.

To test this hypothesis, I first looked at the background of the pertinent theories at hand, reflecting on the considerations for solvency, then I applied the Integrated Information Theory to institutionalized states, and finally reflected on the implications. I established the first premise by finding that institutionalized states met the minimal criteria for IIT's interpretation of a distributed network and by using the integrative embodiment theory of emotions to assert that emotions are causally emergent from experience. I used these assertions to develop the ontological foundation of State Emotion by logically asserting that, as a distributed network, states have a grade of experience; subsequently, State Emotion is causally emergent from the state's experience. The second premise was established by providing a theory of State Feeling, the manifestation of which can be observed, to provide a basis for IIT's calculations of institutionalization and influence to be rendered relevant and explanatory in State Emotion methodologies.

Satisfying these two premises lead to the conclusion that State Emotion is, indeed, a structural process, thus answering *how* these emotions are manifested in state-decisions and providing a model to determine the *extent* of the process. By providing a sufficient theory to meet this central challenge, State Emotion can be reasonably accepted as a valid analytical tool. As a result, it is important to conclude with the direction of future research from the implications of my research.

### **Opportunities for the Role of State Emotion**

Among the many potential avenues of State Emotions in IR that researchers have identified, I suggest that there are two additional opportunities for future State Emotion

research to become a part of other discussions in IR theory, made possible by the implications of the IIT approach. There is now the opportunity for theorists to associate social concepts and tools, such as nationalism and network technologies, as influential factors in a state's decision-making process, and there is the opportunity to create a more intuitive quantitative measure of state "failure" that could equally apply to the legitimacy of newly formed states.

Social concepts and tools that enable the communication of individual feelings or that encourage feelings to become collective have a new role under the IIT framework. These concepts and tools can provide non-explicit measures of integration at the individual level, and thus, contribute to State Emotion. For example, the effects of nationalism in foreign policy and political psychology analyses are known to effect decision-making, and are subsequently central to many theories in these fields.<sup>132</sup> However, the correlation of nationalism to state behavior fluctuates between analyses; often leaving current theories to be circumstantial rather than universal. By suggesting that nationalism is part of a larger measure of State Emotion, the variation in correlations can be accounted for while still allowing for rigorous theorizing.

In addition, network analysis, particularly as it relates to the manifestation of public opinions and feelings in social networks and communication structures<sup>133</sup>, can be tied to State Emotion through the ways that it enables further integration. With network technologies, physical distance is becoming less of a mediating factor in how frequently interactions take place, and with the aide of such technologies, oftentimes more information

<sup>132</sup> Kosterman, Rick, and Seymour Feshbach. "Toward a measure of patriotic and nationalistic attitudes." *Political Psychology* (1989): 257-274.

<sup>133</sup> Agnew, John. "The Territorial Trap: The Geographical Assumptions of International Relations Theory." *Review of International Political Economy* 1, no. 1 (1994): 53-80.

can be conveyed over shorter periods of time across a larger distribution of people. Thus, with the increase of technology, former limitations on the level of integration within a state will further dissipate, having a potential effect on State Emotion.

The failure of a state is an elusive concept as there is currently no consensus on its measurement, as the notion of “legitimacy” is a matter of interpretation. While it is clear which states have failed under extreme scenarios, such as when the government collapses, efforts to define the initial point that tilts the scales to such extremes remains vague. Knowing which states have failed is essential to preventing many international threats such as terrorism and to provide humanitarian aide to where it is necessary<sup>134</sup>; as a solution, some international organizations have developed comparative indexes based on general qualities of a failed state. For example, the US-based Fund for Peace has established characteristics of a “fragile” state, which all remain open to interpretation, that are used in their “Conflict Assessment System Tool” to focus on the loss of control, authority, domestic capabilities, and international capabilities.<sup>135</sup> While this is by no means the “best” definition, it can sufficiently embody what it means to fail for the purposes of understanding the insights of State Emotion.

State Emotion under an IIT framework has relevancy over these four characteristics. The laws of a country are part of the integration of a polity; without control over its own territory, a government cannot maintain high levels of  $\Phi$ , reducing its capability to have State Emotion. If the authority to make decisions on behalf of the collective is dependent on the use of State Feelings, then the loss of that authority implies that the State Emotions of the state are no longer tied to the collective. Domestic policies, such as public services, are

<sup>134</sup> Rotberg, Robert I. "Failed States in a World of Terror." *Council on Foreign Relations*, July/August 2002. Web.

<sup>135</sup> Stepputat, Finn, and Lars Engberg-Pedersen. "II. Fragile States: Definitions, Measurements and Processes." *Fragile Situations: Background Papers*. Copenhagen: Danish Institute for International Studies (2008): 21-31.



necessary to sustain the polity's motivation to remain integrated with the state, and the inability to provide such services directly impacts the quality of State Emotion. Finally, assuming that State Emotion is the means by which states interact with others in the international community, the loss of the first three characteristics would impact the state's international capabilities as well.

Therefore, the “failure” of a state could be seen as the loss of its capability to sustain the State Emotion from its constituents. This insight allows for the calculation of State Emotion, or the quantity of  $\Phi$ , to serve as an analytical tool to determine the failure of a state: low levels of  $\Phi$  are more likely to fail than high levels of  $\Phi$ . This can be reversed to also determine the legitimacy of new states, such as Taiwan or the European Union, through the *Exclusion* postulate; if  $\Phi^{\text{Max}}$  (the local maximum of integration) within a territory belongs to the new state rather than the original state, then the capability to sustain the population's State Emotion can only exist in the new state, confirming its legitimacy. On the other hand, if  $\Phi^{\text{Max}}$  remains attributed to the original state, then the entity challenging its position would merely qualify as a paraconscious mechanism.

### **Limitations in Future Research**

While the IIT approach to State Emotion provides many benefits and enables greater freedom for theorizing, a few limitations remain that affect the nature of future research. Though these limitations do not necessarily restrict the use of IIT, they do pose substantial challenges for determining fully accurate calculations of  $\Phi$ , allowing for a reasonable chance of error in comparative observations. The complexity of the IIT and the accountability for variables impose those limitations.

The limitation of the complexity of IIT is posited by Tononi himself. To account for

every possible interaction in every possible circumstance between neurons would be an immensely complicated evaluation; so complicated, in fact, that such a methodology is currently inaccessible in regards to any scientific or computational capabilities.<sup>136</sup> This situation is similar in the evaluation of states; we cannot even feasibly account for every single individual interaction as it relates to a single behavior, let alone every possible interaction under every possible circumstance. As a result, the true value of  $\Phi$  can never be accurately calculated in either neuroscientific pursuits or IR inquiries. However, this limitation does not prevent the use of the theory; although the true value of  $\Phi$  is inaccessible, estimations can still bring comparable insights into the relationships within and between states.

In addition, the accountability for variables brings forth a similar limitation. Separating the elements that are the core causes within *concepts* from the ones that are merely variables cannot be objectively determined. Theoretically, every mechanism that influences the outcome would be part of the calculation; in practice, since the true  $\Phi$  requires too much evaluation, the evaluation of causal mechanisms must be prioritized to focus most on the ones that make the most differences. This consequently leaves the calculation up to a small degree of interpretation, as there may not be a consensus on the ranking of every certain causal mechanisms in these analyses. This limitation requires that future research specifies which causal mechanisms are included in each analysis in order to maintain the analytical consistency between studies and validate cross-study evaluations.

<sup>136</sup> Oizumi, Masafumi, Larissa Albantakis, and Giulio Tononi. "From the Phenomenology to the Mechanisms of Consciousness: Integrated Information Theory 3.0." *PLOS Computational Biology*, 2014.

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